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# NEW TRENDS IN URBAN PLANNING

Studies in Housing, Urban Design and Planning

*Papers given at an International Symposium at Tel Aviv, December 1977*

Editor

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*This book is dedicated to the memory of  
Eng. Elhanan Pelles, the founder of ITCC and the  
president of its Executive Committee whose vision and  
stamina were the moving force behind this conference.*



## Introduction

In accepting the honour of writing an introduction to this formidable set of papers I have found it difficult to detach myself from involvement in their production. As such I was concerned as a member of the initiating committee, as a participant throughout and in presenting both the opening paper and the concluding remarks, as a commentator rather than rapporteur. From this involvement, the question must arise: What is it that we have in fact collectively given birth to?

The first thought is whether or not the initiating committee have achieved what they set out to do. They had a reasonably clear, and they thought, confined objective: to deal with urban planning, to observe trends and to concentrate on those that were new. And having conveyed this in the title they are then amplified in the invitation to authors by offering brief guidelines in saying that the trend could relate to the whole aspect or experience. But the response to the theme and guidelines revealed that they were not so confined as we had imagined. As the titles of the papers show, urban planning has been very widely interpreted; there is certainly no consensus as to what is a trend; and there is difficulty of defining what is new about such a trend.

This uncertainty has clearly led to an unevenness in treatment throughout the conference which will cause some eyebrows to be raised at certain papers under the heading of the conference title. Simply to take the third of the questions just raised: Is a trend new when it emerges in the mind of a particular contributor or can it only be new when it offers fresh insights on an old well-worn topic, or must the topic itself be new? Is it new if just emerging in a particular country but is well known elsewhere?

Put this way the conference proceedings were valuable in highlighting the difficulties of even attempting a topic of the kind enshrined in the title, certainly in a subject like urban planning with its very wide array of theory and practice in different countries, in different aspects and in different kinds of researcher and practitioner. And perhaps this very diversity makes it impossible to hope for a clear statement on new trends in relation to a topic practised internationally in such a varied way, except in a much tighter framework than the one which we set up.

But this certainly did not undermine the value of the contributions to the audience which was present, and hopefully to the wider audience who will be reading the book. Just as the topic is varied around the world so is the level of knowledge, degree of participation, aspect of

concern of the individuals who are practising in urban and regional planning, be it as a researcher, teacher, practitioner, administrator, politician. In other words, each will take his own message from the book as to new trends in urban planning without worrying whether the claim to its being a "new trend" can be justified on professional or academic criteria. It is from this viewpoint that this particular participant gained much from the papers. And, he is sure, others will do likewise.

Nathaniel Lichfield  
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## Introductory Note

Most of the papers presented at this panel are of an abstract theoretical or methodological nature, being concerned with the overall problems facing planners in their striving at an enhanced quality of life in human settlements. In this brief review, only some of the ideas brought up by the various authors receive mention, but it is hoped that such cursory references may whet the reader's appetite for the full fare.

One paper which is of a more concrete nature is referred to at the end of this review. It deals with specific developments that are taking place in Israel and elsewhere, but the reported practice may perhaps be found worthy of emulation also in other countries.

One of the theoretical papers presented at this panel, the one by Prof. Nathaniel Lichfield, relates to planning aspects of a general nature. Entitled "From Urban Planning to Settlement Planning", the paper highlights some of the significant trends in the recent change of focus due to the view that the key word "settlement" is a better contemporary definition than "urban planning".

In support of this view, the author states that the theory and practice of urban planning is found to be inadequate for the purpose of remedying deficiencies in urban areas and steering their growth towards a better future than would emerge without such planning. As a result, urban planning is under continuous pressure for change in itself, as evident in various countries. Attempts to plan urban areas or settlements inevitably raise the problems of the region within which they function and, consequently, questions relating to national settlement policies of the country as a whole.

An urban planning system includes a series of features, such as implementation of plans, participation of the public and education of the manpower needed. It raises questions of the urban facilities and such functions as, for example, the economy of the urban area in its region, its social framework, the education, health and welfare of its population, natural environment, etc. The level of planning is thus raised to that of corporate and community development planning.

As a continuing part of the evolution appears the question of the extent of government intervention needed in the society to advance the overall goals.

Given these trends, Prof. Lichfield concludes, can we be confident about practitioners being able to follow them; and what needs to be done to ensure that human settlement planning can be successful?

In taking up another aspect of planning, Prof. Ernest R. Alexander, in his paper on the subject of "Policy-Planning-Implementation: The Missing Link", points out that policy evolution, plan development and implementation have each been carried out in isolation. These phases are, in fact, an organic whole, and the author

analyses a model of this continuum while referring to sixteen relevant case studies.

The model presented by the author includes four stages: stimulus, policy, program development and implementation. These stages are connected by a network of alternative paths, mediated through "links" between one stage and the next, which permit any stage to be by-passed, or the process to come to a premature stop after any stage. Variations involving feedback loops between stages are also reviewed.

The model is presented as a conceptual framework of the policy-planning-implementation process, focusing on the stimuli for the process and the links between its stages.

It appears, the author concludes, that the policy or plan/program quality is not a necessary or sufficient requirement for implementation, though it may affect ultimate success or failure. This negative finding, though tentative, suggests the importance of analyzing the process as a whole, with special focus on the links.

Another subject of interest to planners is taken up by Dalia Kadury Lichfield in her paper entitled "Onwards from Urban Design". The author first defines what is generally understood by urban design in practice and proceeds to discuss the communication gap between architects and planners. The existence of such a gap explains some of the impediments to the development of urban design that should, were it not for this gap, be a clear meeting ground between the practitioners of architecture on the one hand and those of planning on the other hand.

In reviewing next the practice in use of the planning and development briefs, as currently used, the author offers a critical comment on their aims and shortcomings.

In conclusion of her paper, Mrs. Lichfield amplifies on the element of urban design in the development brief and shows how the concepts in the development brief put urban design into a better perspective than the one it currently enjoys. Urban design, the author considers, can thereby gain a more fully articulated role.

The application of general planning principles, as seen in the particular case of British experience, is the subject of a paper by Prof. Edgar A. Rose, entitled, "Monitoring and Review in the Planning Process - Some Practical Problems". The author finds that the turbulence in the environment, combined with the inertia in the British political and administrative system, conspire to frustrate any attempt to make planning objectives clearer and operational, capable of review and revision through time.

Prof. Rose presents a selective review of approaches and attempts evidenced in the U.K. to monitor plans, with a view to shedding some light on these aspects and on the institutional constraints involved. He suggests a number of theoretical questions that may be understood as tentative ways of reducing problems relating to review and monitoring functions. These questions are followed by an indication of some tentative conclusions.

Some of these conclusions are that politicians are now much more concerned with matters such as the measurement of social response to strategic planning issues. If the progressive abandonment of the positivistic and comprehensive planning modes has been largely the result of the discrediting of plans and predictions, as well as advances in theoretical understanding, it is also worth noting that practical attempts to simulate the urban system have been abandoned. More modest objectives are being pursued. Sometimes the pendulum has swung too far and pragmatic or ideological approaches result in intuitive and highly subjective responses. Such

attitudes are understandable at a time of minimal demographic and economic growth, when some of the fundamental rationales which have underpinned national and regional planning are being questioned.

The author concludes his paper by saying that the practical problems of monitoring and review of the planning process in the U.K. remain for the most part unsolved.

The techniques chosen in analysing the planning of a metropolitan area are described by A. Mazor and A. Krause in their paper on "Application of Non-metric Approaches in Urban and Metropolitan Planning". The application of nonmetric analysis techniques have constituted, as the authors report, a preliminary stage in the planning of the inner ring of the metropolitan area of Tel Aviv and its satellite towns.

To achieve better understanding of the urban phenomena in this area, 46 variables were chosen and analysed with the use of nonmetric techniques. One of the advantages of this method is that the output can be graphically represented by a computer map, and requires relatively short computer running time.

The major findings arrived at were that none of the urban phenomena was found to be confined to one specific town. The findings have permitted grouping of sub-zones into homogeneous planning zones. Zones involving similar problems were found scattered throughout the entire region, dictating again an approach based on similarity of issues rather than on municipal designations.

A particular form of settlement, specific to Israel, but also known elsewhere, is discussed by Prof. Joseph W. Eaton, David Solomonico and Gavrush Nehushtan in their joint paper entitled, "The Rurban Village".

The authors find that more and more of Israel's farm produce and industrial crops come from small communities that are "rurban" rather than rural. Their work and social interaction system is a blend of village and city life, to use a concept not yet part of the standard English dictionary.

In well developed countries, like the United States, rurbanism is spreading. Industrial plants are found widely in rural areas, employing farmers and members of their families. Prisons, mental hospitals and other services often provide a supplemental economic base to areas that previously had been exclusively agricultural.

Most Israeli farmers find it congenial to adopt a rurban life style. They are of city origin. Two Moshavim, studied by the authors are populated by immigrants from Morocco, who grew up in Casablanca, Marakesh and other major urban centers. Neither they nor their parents were peasants.

Rurban villages are not suburbs. They are more than bedroom communities for persons employed in nearby towns and cities. They have an autonomous economic, social and political base. They provide their inhabitants with an opportunity to live in a closely knit community, without the isolation common to purely rural areas.

Rurbanism is increasingly dominating the thinking of Israel's rural settlement planners. The available agricultural land is often too limited to fully utilize the highly mechanized work capabilities of the population. Water shortages limit the area that can be irrigated and farmed intensively. Many residents have marketable non-farm skills or can acquire them, when needed.

The authors have made a field study of two Moshavim planned originally as agriculturally based communities. Two decades later they were found to be thoroughly

urbanized. Only a minority, 29% in one and 40% in the other moshav, reported themselves to be full-time farmers.

Rurban communities provide an alternative to city living. Since the villages studied acquired a more rurban character, their economy became less dependent on the shift in the price of commodities. Rurbanization is a challenge to social welfare oriented planners. It can help counteract the drift to metropolitan areas from rural areas, with its concomitant side effects in the form of extreme environmental pollution, congestion, crime and anomie which characterizes unplanned human migrations to the cities in so many parts of the world.

Dr. Yigal Tzmir in his paper entitled, "The Public Space Network as a Planning Concept", reviews the current literature on urban environment and finds that there has been a growing interest among planners and designers in the subject of environmental cognition. This interest has been followed by increased efforts to find the planning parameter necessary to achieve a higher quality and broader based level of environmental knowledge.

A difficulty in environmental assimilation on the part of the individual in an urban complex is - Dr. Tzmir considers - the lack of continuity stemming from the great mobility of modern man, necessitated by his pattern of economic and social activities. Human beings, nevertheless, seek structured information in their environment; they want to clearly understand the entire physical network and, of course, they tend to use this understanding in their day-to-day activities. Such understanding is important not only for crystallizing one's instrumental orientation towards the world, but also plays a central role in building up one's sentimental orientation.

The public space network which includes roads, footways, open spaces and public facilities of all kinds in the physical skeleton, constitutes the main functional content and the symbolic measuring of urban life.

At present, the pattern of urban central places in Israel and in many other countries is fragmented and incrementally treated, and there is too little care for spatial human experience, for true urban life. We must - Dr. Tzmir concludes - direct part of our efforts back to the historical orientation of urban design, and integrate old motivation with new scientific theory and modern methodologies.

# From Urban Planning to Settlement Planning

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## SCOPE OF PAPER

Urban planning is carried out by governments in the attempt to remedy the deficiencies of their urban areas and to steer their growth and change towards a better future than would emerge without such planning. As such the nature of urban planning in particular countries must be conditioned by the situation which exists, the predicted rate of change and growth and the goals and objectives of the society in question. The evidence for this is seen in the changes in urban planning within particular countries over time and also in a cross section of comparison of countries at any particular time. But the theory and practice of urban planning tends to lag behind the changing pressures from these societies and it is under continuing pressure for change in itself.

The purpose of this paper is to give some account of the new trend under such pressures in this urban planning. In doing so it is possible to follow various courses. For example there could be some account of the changing context in which the urban planning is taking place, as a basis for understanding the trends within its theory and practice. Some examples are the recent changes in the international economic situation, with a slowing down of growth rates, inflation which is difficult to control, mass unemployment which is difficult to reduce, rising prices for energy and prospects of scarcity. Another important context is the changes in the politics of planning, whereby there is growing disaffection in democracies against the centralisation of government, the rise of bureaucracy and failure in involving the public in plan and policy making, together with a lack of confidence in those on the socialist wing to manage acceptably the transformation of society which they have been advocating. In the face of these complexities there is the third and hopeful context in the growth of international collaboration in important sectors of the world economy, such as the United Nations' initiatives on environment (Stockholm), population (Bucharest), food (Rome), status of women (Mexico City), water resources (Mar del Plata) and last but not least for this paper on human settlements (Vancouver).

Such an approach, the tracing of trends in urban planning in relation to the social, economic and political forces affecting it, would offer a complex undertaking. Accordingly another more direct approach is taken, by direct examination of the trends in urban planning in one developed country where it is advanced, Britain (2), and the contribution that urban planning is making to development in developing countries (3) and then the stimulus which was offered in the field by the UN Habitat Conference on Human Settlements in May/June 1976 (4).

## TRENDS IN DEVELOPMENT PLANNING IN BRITAIN

For reasons which have never been fully established, Britain is by common consent a leading country in the evolution of its urban planning system as an innovator and exporter. Perhaps it was the early consciousness of the squalor of the urban system

built by the first industrial revolution in the world; perhaps the long tradition of good management of the land in the British land owning aristocracy; perhaps the system of property in land which recognised obligations as well as rights. But whatever the reason, World War II was in Britain the innovation of a revolutionary system of development planning for town and country covering the whole country (whereas in some other countries the War saw very little change; and following experience of twenty years of such development planning there has been introduced the well known Mark II style of development plan, which has influenced practice around the world.<sup>1</sup> Accordingly it is of relevance for this paper to note some trends in this advanced urban planning system. This is considered under three heads: scope, method and practice.

The scope of the planning is certainly widening and not narrowing, as the demands on it grow in terms of the problems and opportunities which need to be tackled. Soome examples will illustrate. While the aim of fusing the physical, social and economic aspects of urban planning has been pursued, so far it is not yet fully successful but the trend is certainly to try and make it so. There has been success in introducing into the plan the policies which are not site specific (that is indicating the attitudes of the authorities on particular matters when making future decisions) alongside the more concrete proposals which are site specific. There has certainly been a widening of the scope of the planning to make it an integral feature of the corporate planning of local authorities, whereby all their activities are seen comprehensively with development planning as one strand and indeed urban planning and urban management or governance are seen as an interrelated process. In passing it should be added that parallel move has not been made in central government, where ministries are the big brothers of the local authority departments.

Coming to planning method, there seems to be consolidation in certain critical respects. There continues the use of a variety of plan making instruments within the overall development plan to suit circumstances, without reliance on one particular plan, such as key diagrams, district plans, action area plans. Planning decisions are incorporated with the day to day decisions of the municipalities or central government, and not being seen as distinct. And the widest array of professional skills are being brought to bear in planning, so that multi-disciplinary team work is the common and not rare feature in planning offices. But as against this there is the continuing weakness in the difficulties of ensuring that there is implementation in accordance with the planning policies, so that gaps continue to emerge between what is proposed and what in fact occurs on the ground.

But there is nonetheless dissatisfaction with the practice of development planning as a whole, which is growing rather than decreasing. For one thing it is weakened by having been evolved as a local government operation, without a comparable system in support at the national and regional levels; there still is in Britain no co-ordinated national planning, of the economic or physical development kind, although particular sectors have their plans and programmes (e.g. motorways, electricity power stations, national parks, location of industry). And there is still uncertainty as to the levels at which regional planning should be carried out, as a bridge between the local and the national; regional departments of central government act in co-ordination with power to implement their policies, using as a framework the regional strategies prepared by a Regional Planning Council nominated by government with no powers at its disposal.

Then at the local planning authority level there is continuing tension and friction between the two tiers which have been created: the strategic or county level and the local or district levels. Politically and professionally the wars go on. This tension, and also the regional uncertainty, is part and parcel of a ground swell



towards greater devolution from the centre to the locality, as a reaction against planning from above. And finally the public who are affected by the plans are becoming increasingly vocal and powerful, both as against their elected representatives and against the planning bureaucracy using the powers for participation given them in the Seventies.

But there are still unclarified difficulties in the manner in which this power is to be used in the ongoing planning situation, which adds to the confusion and ineffectiveness of the planning system itself. This is not simply a feature of the people flexing their muscles against elected representatives at whose representation of their interests they are cavilling, but also some doubt as to the value which the planning system provides for the considerable costs that it involves. In the face of the unconscionable delays and frustrations in the working of the controls over development and in the denials to development in a country with a slack economy. There is some scepticism as to whether this sophisticated planning system is in reality improving the "quality of life".

Thus even this most sophisticated of all local development planning systems has far from settled down in its new look, and accordingly it cannot be taken of necessity as the marker for the future. Indeed there are fumbings which could indicate further changes in the near future. The lower tier district councils as a whole are wishing to see a shift of power to themselves which the County Councils as a whole are resisting, pressing for retention of the present system which gives them the strategic role. But their conflicts could be put into the melting pot again, since the Labour Government has indicated some dissatisfaction with the Tory created system of local government reform which was effected in 1974, some twenty-five years after the initial probes in this direction by the post-war Labour administration. And a recent report by a working party of professionals in planning concluded that the structure planning system is unsatisfactory in many ways and "in order to reduce the time taken and the cumbersome procedures, it could either be dispensed with altogether or drastically modified." In its place they visualise a "series of policy reviews on environmental issues, plus action plans and programmes"<sup>2</sup>.

If the present system is unstable, and could be changed, what are the discernible trends? These are difficult to earmark simply because of the welter of debate and the uncertainty as to what is emerging. Probably the trends will become clear only when the Ministry involved, Department of the Environment, formulates views in consultation with other Ministries and bodies; and perhaps they will not do so until they have had the benefit of the well tried British measure of a commission to investigate what is happening and to make recommendations.

In advance of either of these events the report just mentioned is of interest since it is in the nature of an informal investigation into the planning system carried out by a group of informed professionals. They had no formal terms of reference but set out to make proposals for a better form of planning having regard to the evolution of the British planning system, the criticisms which have been emerging about this system and the great transformation in the state of Britain. Some of the criticisms echo those made above, for example that the system is too slow, too weak in implementation, too little related to the decisions which impinge on people's lives, imperfectly related to other areas of local government activity, become too involved in politics, etc.

In the light of our review of trends, what is their conclusion as to the future of planning? In essence this is that planning must become bigger and better than it was, and more powerful and comprehensive.<sup>3</sup> The new planning would be an integrated process comprising economic, social, environmental and resource planning at every level of social organisation; should be community based in being related more closely to needs at the local level and involving partnership between public and private

agencies and individuals; must be related to the availability of natural, human, finance resources; and must be geared to the promotion or management of change, with the bureaucratic processes speeded up and the planning, resource and implementation agencies dedicated to achieving necessary action quickly.

Following this approach, there are then spelt out the implications for government, the community and the planning professions.

To the authors the Report is the participation in a debate which is going on.<sup>4</sup> But if the Report's recommendations are an indication of what is to be accepted in Britain, the trend clearly is more of the same, with the criticisms to be met by a more comprehensive and powerful system of planning. But whether this would be acceptable remains to be seen. There are views to the contrary that the system has become too weighty and bureaucratized, too involved for reaching smoothly a reasonable decision.

#### CONTRIBUTION OF URBAN PLANNING TO NATIONAL AND REGIONAL DEVELOPMENT PLANNING

So far we have looked at the evolution of urban planning in Britain in response to the perceived needs of people in urban communities. It so happens that by looking at such planning in the country where it is most advanced we have also been looking at its role in a country which is one of the most fully developed in the world.

This could be obscuring another trend in urban planning: its role not in relation to a developed country but in relation to the needs of social and economic development in a developing country. What trends are discernible here?

The fundamental difference between the developing (under-developed, undeveloped) countries and the fully developed is obviously the stage of development which has been reached. The progress along such stages is typically measured by a range of social and economic indicators (GNP per head, capital investment per head, proportions in industrial employment, etc.). Whatever the differences in the stages it is commonly held that developing countries will be roughly treading the paths of the developed, in terms of production, urbanisation, employment structure, etc., but not necessarily along the same time profiles.<sup>5</sup>

In following these paths it is apparent that the role of the urban system in the country is of significance, since growing urbanisation (in the sense of a growing proportion of the population in the towns, and also in the bigger towns) is a manifestation of development. Thus the question that arises is whether the urbanisation patterns of developed countries should be followed in the less developed, including the rate of migration from the land to the cities; and within this question, how urban planning can help in setting out to reach an urbanisation pattern which can make its maximum contribution to the development of the country, in both the economic and the social (that is non-economic) sense. And within the scope of this paper, does this mean that the trends in urban planning which are seen in the more developed countries are those which should be absorbed in the developing countries? Is urban planning to be transferred in the same way as university education, agriculture, transportation, etc.?

As a preliminary to answering this question it is useful to consider one trend in urban planning: how the gap is being broken down between the concept of "development" in the urban planning scene and that of "development" in the national and regional economic planning scene. Traditionally the two have quite different connotations<sup>6</sup>. In urban planning the term traditionally relates to the physical development on the earth's surface (buildings, etc.) or beneath the earth's surface

(in mining a mineral extraction). Thus in urban planning "to develop" is to produce the built environment within the total environment, and the noun "development" describes the finished product in terms of the actual artifacts themselves. And urban planning has grown up with its prime concentration on controlling the change in these physical artifacts, in accordance with social, economic and political pressures.

But in planning at the national and regional level the concept of development is quite different. Given that in a developing country the prime aim is to increase the output of production as a basis for distribution, be this in "economic goods and services" or in "non-economic goods and services", such as educational, health, cultural, etc. services. For this "growth" there needs to be "development". While these terms have been subject to much debate in this context the term means the changes in the social and economic structure of the developing countries which provide the "capacity to produce" amounting to a "mechanism that will produce self sustaining and cumulative indigenous improvement. This capacity is not related simply to changes in productive factors but also to structural changes across the whole of society, in social and political arrangements, institutions and, perhaps most important of all, in the education, health and attitudes of the people of the country, resulting in changes in their skills and efforts.

Given this distinction between the meaning of the critical word "development" in both contexts, and the recognition that at each level we are planning for "development" and "growth", it is of relevance to note the trend in the moving of each kind of planning towards the other. At the local level, certainly in the development plans of Britain described above, there is as indicated the attempt to provide for physical, social and economic issues concurrently. But this can be attempted in two ways. First, flowing from the traditions in town and country planning, by recognising that the physical development with which the urban planner is concerned is a manifestation of the social and economic activities of the community, and that accordingly he must study and comprehend these activities in order to provide a physical base for them, and indeed test and evaluate his plans in relation to the socio-economic impact of the policies, plans and programmes relating to physical development.<sup>7</sup> A second attitude is not to be content to be providing for the physical manifestation of the social and economic systems but to provide also in the same "urban planning system" for the planning of these social and economic systems also. To give examples, the urban planner would be providing not only the local development plan but also the educational, health, economic, welfare, etc. systems of the community so that they can all be tied together in one comprehensive plan and programme.<sup>8</sup>

At the other extreme, the national and regional planning levels, there has been a tendency to plan for these systems without recognising the relationship between them and the physical development system which is the preoccupation of the local planners. Put simply, economic planners at these levels have tended to disregard the "spatial" dimensions of their planning. This has led to patently unreal situations where production from factories has been assumed at certain rates without regard to the differences that would arise from different locations of these factories (a key factor in urban and regional economics); and the internal and external distributive systems of the country have been planned for without recognising the implications of an infrastructure of internal and external communications (via road, rail, air, sea, etc.).

But the trends are certainly to recognise the interpenetration of the two kinds of development planning. And having shown the gap, we can now return to the question posed above: should the developing countries simply take over the advanced model of the developed countries, bearing in mind that they are roughly treading the development path of the developed countries?

On this trends are reasonably clear. Where countries are growing rapidly, owing to oil or other natural resources, they must of necessity bring in expatriate skills to assist them in their urban planning (as in other developmental activities) and there is the general tendency for the expatriates to import into the country the styles of planning which have been familiar in their own experience. And where the countries are not blessed with these natural resources and growth, and are therefore the recipients of aid or loans for the purpose of planning, they are again influenced by the practice in the countries which are offering the aid. Thus there tends to be an export of urban planning as practised in developed countries.

But in this there is also a counter reaction which is setting up a different trend. This recognises that the system of urban planning should be geared to the needs of the country in question at that particular stage in its development, and be ready to change as development advances along its stages. This then is leading to the need to consider ab initio the styles of urban planning which are appropriate to a particular country at a particular time, without the assumptions that all that is needed is the import of ready available skills and knowhow. This is bringing with it a further trend: that the thinking out afresh on the contributions that urban planning can make in developing countries raises to the fore question for the practice in the developed country from which the consultant or the adviser comes. This is leading to a most interesting feedback whereby it is the experience of the developing countries which is aiding those in the developed.

#### THE IMPETUS FROM VANCOUVER

Whereas in section 2 we looked closely at trends in the country with the most sophisticated urban planning system, and in section 3 we looked at trends in particular strands across the world, in this section we look at the impetus given to the whole of the urban planning movement (and many other movements besides) from Habitat the United Nations' Conference in Human Settlements in Vancouver 1976. Taken simply at its face value the event was of great significance. The governments of the 132 U.N. nations participated in a two week conference, following two years of preparation, reporting back to the U.N.; concurrently there was a Habitat Forum conference of non-governmental organisations open to all which in its own way was as effective as that of the governments. And both were stimulated by the eminent group who posed the basic questions, the Vancouver Symposium. Impressive resolutions were passed, almost unanimously, covering a wide array of topics relating to human settlements. And the initiative has been followed by action in particular countries. Indeed it is predicted that the real impact of the conference will be seen in these national follow-ups rather than simply in the resolutions, however impressive, passed at the conference itself. But there will also be international stimulus in the formation of the new Settlement Centre in Nairobi, taking over the work amongst others of the U.N. Centre for Housing, Building and Planning.

The impact of the conference for urban planning can be seen in many strands.

First, there were the national reports prepared by each of the contributing governments, each around six major themes: settlement policies and strategies, settlement planning, shelter infrastructure and services, land, public participation, institutions and management and international co-operation. Taken together these presented a comprehensive review on comparable lines for human settlement planning around the world.<sup>9</sup> But more important was the focus of the conference's work, in the material it prepared and in the scope of the discussions, which elevated the theme from what is generally recognised in planning of settlements to the whole of the concern for mankind in its worldwide crisis. This is illustrated in the following extract from the major Spirit of the Vancouver Symposium, Barbara Ward:<sup>10</sup>

"What is actually being discussed is the threatening growth of the world's numbers, the grain to feed them, and the safe water to restore their health, work to end hopeless unemployment, the skewed income that are bitter with injustice, energy - the safe energy - to carry on the whole human experiment. Never before has the world's housekeeping been thus discussed, and therefore at least a chance that for each conference with all its preparations and explorations and with, it may be hoped, a rigorous mood to demand resulting action, the world can move from talking about its problems to beginning the forms of joint work and action which, in the long run, offer the only way of bringing into a single planetary community all the tribes and races and nations and ideologies, all the hopes and fears and energies of this fantastic human breed."

Thus despite the reference to *Habitat* the Conference was not confined to the planning of human settlements *per se*; and indeed the term human settlement was not defined at all. But nonetheless the contents of the national reports were geared closely to those aspects of urban and regional planning which are familiar to us, as can be seen from the annex which lists them.

These reports were reflected in the outcome of the Plenary Sessions, in three documents:<sup>11</sup>

- (a) Vancouver Declaration of Human Settlements 1976;
- (b) Programmes for international co-operation;
- (c) Vancouver plan of action.

Of these it is the third, the plan of action, which is most relevant here, since directly or indirectly they will be influencing the trends of settlement planning in the participating countries. Together they amounted to sixty-four recommendations which were approved by the conference (except for one of the recommendations dealing with settlements in occupied territories which was linked with the Arab/Israel issues; this was not adopted by consensus but approved by a majority vote). These recommendations to action follow the first six headings of the structure of the national reports shown in the annex, the seventh being dealt with separately under the second of the above headings "Programmes for international co-operation".

There is no space here to consider all the recommendations for action. But what can be said in the context of this paper which is concerned with trends is that the actions which were recommended were certainly very forward looking and advanced in relation to the topic of urban and regional planning and not of a withdrawn and negative kind. As an example annex 2 reproduces those dealings with the first of the six themes, settlement policies and strategies.

An indication of this is the fact that the recommendations as such have been seen as a stimulus to settlement planning in Britain, which as indicated above is recognised as having an advanced system of urban and regional planning. Under the evocative title of "*Habitat United Kingdom: a shift of vision*" four British planners showed how practice in Britain could be advanced using as a stimulus the recommendations of the Vancouver plan of action.<sup>12</sup> Using the recommendations as a basis there were explorations of the implications for Britain in its national settlement policies, planning of human settlements, public participation in planning with self managing communities and national policies.

Thus at one sweep there has been an injection into the urban planning movement from the international conference at Vancouver, following similar injection in previous years in relation to the natural environment, population, food, water resources.

It is in this sense that perhaps a "turning point in urban planning history" will be referred to in the future, if not in terms of achievements which will be realised around the world (which faces tremendous difficulties) at least in the international thinking on this topic of urban planning, and the trends in theory, practice and approach which will result. To give one instance, which has a domestic flavour for the speaker, there is the stimulus given by the recommendations on land in the strengthening of an organisation, The International Centre for Land Policy Studies, which had already been founded by himself and Dr. Haim Darin-Drabkin, with the aim of advancing the theory and practice of dealing with land in settlement planning around the world.

#### SOME CONCLUSIONS OF THE TRENDS

From this review of trends in urban planning in three different contexts (Britain, comprehensive development planning and settlement planning) it is apparent that there are pressures which could sweep urban planning along at a rapid rate around the world. But while it is likely to do so in thinking and discussion, it is unlikely to do so in terms of practice, simply because of the time lag that must emerge in the adaptation of such practice within particular countries. To be effective it must be part of government; government itself moves slowly in these matters; and the interests of urban and regional planning would not be advanced by changes which are too rapid.

Thus there is the occasion to pause and consider where the trends are taking us and how as professionals we could react to them. Accordingly in conclusion I offer a few personal pointers as a basis for some discussion.

1. The planning of human settlements is clearly a growth industry, born not so much by the promotional vigour of its professionals as the pressing need created in the settlements themselves. As these problems emerge there is the call for some guided action in the future, which we call planning. Such planning will continue its extension to more and more sectors of social and economic life (food, international trade, population growth, education, health, water resources, etc.) and will also be found at the varying levels of society (the national, regional, urban and local communities). Since all these problems are inter-related, and all these planning activities are generically of a similar kind, there is a tendency to develop comprehensive models at the macro level which are all embracing.

This is in my view likely to defeat the purpose. While the foci of planning endeavour will multiply, and while they are certainly all inter-related, human capacity and organisation cannot embrace it all. Thus some division of function should continue to operate. More specifically urban and regional planning should continue to do what it can, elevated to the planning of settlements, and not what it cannot (e.g. in terms of the broader societal planning). This must be achieved by collaboration between the various sub-systems, with urban and regional planning providing some kind of framework, since in relation to land and development it embraces all the sub-systems.

2. Whichever of these courses is followed, it is clear also that the changes which will be introduced into planning systems of all kinds will be rapid. This will flow not only from the dramatic changes in the social, economic and political environment within which the planning takes place, but also in the rapid advances in this kind of planning which will be made in the large surface of the world embracing the developing countries. Given such changes it is important to adopt some clear approach to planning, its purposes, procedures, practices, etc. which can be adapted to the circumstances in mind. Thus planning should not be evolved in the abstract but rather to discharge the functions which it is called to undertake,

adapted to place and time.

3. However this is introduced the need is not for plan making on its own but for a "planning system", which covers all the necessary facets, with a view to keeping them in some balance. For example, one formulation of such a system<sup>13</sup> envisages the six functions of:

- (a) Plan making in its relation to policy making;
- (b) Plan implementation;
- (c) Co-ordination of public decisions;
- (d) An appropriate political, administrative and professional machinery;
- (e) Participation by the public which is affected; and
- (f) Means of communication among all parties to the process.

Given a system which comprises all these functions it is apparent that plan making which does not have an appropriate plan implementation will be powerless; plan making of various kinds and levels without co-ordination will be chaotic and counter-productive; a highly developed professional machine which has no sympathetic communication with the politician will be fruitless; and unless there is communication between all those involved the process will arouse only bitter debate.

Furthermore it follows that if such a system is to be kept in balance it must be adjusted for the particular country in question at the particular time; if any of its constituents are out of phase or balance then the whole will be liable to frustration.

4. But given a system of this kind it must be attuned to the levels of intervention in the ongoing social and economic processes which are consistent with the politics, culture, ideology and traditions of the country in question. In this all countries vary, and their movement in this respect is slow. From this it follows once again that a particular system cannot be readily introduced from one country into another without checking that the conditions of the country are appropriate for its introduction and absorption.

5. Finally it has to be emphasised that urban planning is an act of government (if it is to be at all effective other than in education or discussion) and that government is a matter of politics and politicians. Here lies the discrepancy which is at the root of many planning failures: the inability of the professionals to propose a planning system which is acceptable to the politicians, and the inability of the politicians to find the aid from the professionals which will assist them in their administration.

In other words there is a need for some closer relationship between the decision making model used by planners and those used by the decision takers, essentially the politicians. Just how this closer relationship is to be achieved is too wide a topic to be entered into here. But that it must be achieved is essential if planning is to prosper.

And happily the recognition of the need for closer understanding between the planners, people and politicians is one of the trends.

ANNEX 1: STRUCTURE OF NATIONAL REPORTS SUBMITTED BY GOVERNMENTS TO  
THE HABITAT VANCOUVER CONFERENCE 1976

1. Settlement Policies and Strategies
  - National Settlement Policies
  - Settlement Development Strategies

- Critical Aspects of Settlements
  - Socio-economic Aspects
    - Human Resources
  - Demographic Aspects
    - Population distribution and migration
    - Family planning
  - Environmental Aspects
    - Settlements and the natural environment
    - Natural resource use and conservation
- 2. Settlement Planning
  - Regional Planning
  - Metropolitan Planning
  - Rural Planning
  - Special Planning Approaches
    - New Towns
    - Special Groups
- 3. Shelter, Infrastructure and Services
  - Shelter
    - Design and Construction
    - Slums and Squatter Settlements
  - Infrastructure
    - Energy
    - Transportation
    - Pollution Control
    - Water Supply
    - Waste Disposal
  - Social Services
    - Public Health
    - Education
    - Recreation and Tourism
- 4. Land
  - Land Tenure and Control
  - Land Resource Management
- 5. Public Participation
  - National Report Page References
- 6. Institutions and Management
- 7. International Cooperation
  - National Report Page References

ANNEXE 2: RECOMMENDATIONS DEALING WITH SETTLEMENT POLICIES AND STRATEGIES<sup>14</sup>

National Settlement Policy

a. Every aspect of human settlements: social, environmental, cultural and psychological is profoundly affected by the level of economic development, population growth and movements, as well as social relationships. The task of dealing with the consequential and rapid changes in the range and location of human activities, within the constraints of limited resources presents both a new challenge and a unique opportunity to achieve more balanced development in every nation.



- b. All countries should establish as a matter of urgency a national policy on human settlements, embodying the distribution of population, and related economic and social activities, over the national territory.
- c. Such a policy should:
- i Be based on the goals and objectives stated in the Declaration of Principles;
  - iii Recognize that difficult choices must be made between conflicting requirements;
  - iii Embody both a firm political commitment and public understanding of its implications;
  - iv Be based on a critical assessment of the present situation of human settlements, the emerging trends and the impact of past policies;
  - v Be devised to facilitate population redistribution to accord with the availability of resources;
  - vi Focus on the central role of human resources as an agent for development;
  - vii Take into account the World Population Plan of Action.

#### Human Settlements and Development

- a. There are fundamental relationships among the distribution of population, environment, economic activities, and the pattern of human settlements. National policies for economic and social development can no longer afford to neglect or minimize the role of human settlements.
- b. A national policy for human settlements and the environment should be an integral part of any national economic and social development policy.
- c. An integrated human settlement policy should:
- i Be formulated through a truly interdisciplinary approach, concurrently with policies relating to other aspects of social and economic development;
  - ii Be formulated at the highest political level, in co-operation and co-ordination with regional and local levels as appropriate;
  - iii Be consistent with the preservation, restoration and improvement of the natural and man-made environment, cognizant of the positive role of environment in national economic and social development;
  - iv Be directed at all settlements, rural and urban, dispersed and concentrated old and new;
  - v Be considered in all efforts to implement the New International Economic Order;
  - vi Take into account the changing roles and responsibilities of women and the impact of development and programmes on women, both as participants and beneficiaries.

### Content of National Human Settlement Policy

- a. Institutions responsible for planning and programmes at all levels, should receive clear guidelines from an explicit policy statement on human settlement issues.
- b. A national human settlements policy should concentrate on key issues and provide basic directions for action.
- c. Such a policy should:
  - i. Promote the goals and objectives of national development and translate these into spatial terms;
  - ii. Outline strategies appropriate to different time perspectives and different scales;
  - iii. Establish priorities among regions and areas, especially in relation to the location of investment and infrastructure, and the satisfaction of the needs of various social groups;
  - iv. Be led by public sector action, and aim at the welfare of the people, with priority to the most deprived;
  - v. Set minimum and maximum standards which should be expressed in qualitative and quantitative terms, based on indigenous values, related to local resources and abilities, capable of evolving over time and developed with the full participation of all those concerned.

### More Equitable Distribution

- a. Human settlements in most countries are characterized by wide disparities in living standards from one region to another, between urban and rural areas, within individual settlements and among various social and ethnic groups. Such discrepancies exacerbate many human settlement problems, and, in some instances, reflect inadequate planning. Human settlement policies can be powerful tools for the more equitable distribution of income and opportunities.
- b. Human settlements policies should aim to improve the condition of human settlements particularly by promoting a more equitable distribution of the benefits of development among regions: and by making such benefits and public services equally accessible to all groups.
- c. This can be done through:
  - i. The location of public sector investments;
  - ii. The allocation of direct subsidies and priority of investment, to selected disadvantaged regions and groups;
  - iii. The use of incentives and disincentives - fiscal, legal or other - to favour or discourage selected activities or areas;
  - iv. The creation of special employment, training and social services opportunities in favour of the most deprived;
  - v. The deliberate improvement of conditions in the most disadvantaged settlements, so as to enhance attraction of such areas in relation to others;

- vi Measures to improve the quality of life of vulnerable groups which have special needs - such as children, the elderly, the handicapped and the disabled. Such measures include provision of basic social services, adequate shelter and social and physical access to facilities.

#### Settlement Development Strategies

- a. An effective human settlement policy concerned with progress requires a strategy which confronts all the relevant issues, makes the necessary choice of means and options and indicates trade-offs in resource and time dimensions. The strategy should also reflect the hierarchy of human settlements and allow for future changes.
- b. National human settlements strategies must be explicit, comprehensive and flexible.
- c. Such a strategy requires:
  - i Definition of socio-economic variable and physical development patterns, and of guidelines for staging and degree of concentration of development programmes;
  - ii Designation of the body responsible for policy formulation;
  - iii Active participation of all governmental bodies and non-governmental organizations concerned in policy formulation and strategy development;
  - iv Active co-operation and participation of all sectors of the population must be obtained;
  - v A means for periodic review to take into account new important developments;
  - vi Particular reference to the major infrastructure networks - transport, energy and communications - and the essential administrative and financial systems.

#### Allocation of Resources

- a. The resources available for improving the quality of life in human settlements are limited when compared with people's need and expectations. Those resources are also too often misallocated; where resources are especially scarce the human potential is often ignored.
- b. The improvement of quality of life in human settlements must receive higher priority in the allocation of conventional resources, which ought to be carefully distributed between the various components of human settlements; it also requires the planned use of scarce resources and the mobilization of new resources, in particular human capacities.
- c. Particular attention should be given to:
  - i Making true social costs and benefits the basis for policy decision and evaluation, not only material product;
  - ii Allocating resources on a spatial as well as sectoral basis, with a view to improving efficiency and accountability;

- iii Encouraging self-help, self-reliance and the organization of interregional solidarity;
- iv Research priority for critical factors in the development of human settlements, especially energy and technology;
- v Development of new sources of finance, with suitable terms and conditions.

#### Constant Review

- a. Because of their complexity, dynamism and persistence, human settlement problems require sustained national attention and continual reassessment.
- b. Governments should report publicly on a continuous evaluation of human settlements conditions.
- c. This may involve:
  - i A permanent national body reviewing human settlement problems and issues;
  - ii A national or regional periodic review of settlement development proposals to assess potentials, social and environmental costs and benefits of alternate systems of development;
  - iii A periodic report by the Head of State or Government on the achievements and failures of the past period, and goals for the future;
  - iv Independent monitoring and evaluation components in all major human settlement programmes, projects and institutions.

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# Monitoring and Review in the Planning Process: Some Practical Problems

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## INTRODUCTION

Monitoring and review is directed towards the dimensions of change and public policy formulation. Conceptually, its measurement demands a second order abstraction; it involves not only the use of numbers, which are themselves abstractions, in the comparison of two or more sets of properties or events, but also the assessment of the significance of the time lapse occurring between them. (Joyce, 1977)

The complexity of the urban process has defeated attempts to simulate it with any great success, whilst the boundaries of present problems and ways of resolving them are at best ill-defined. Caution and pragmatism have replaced mechanistic certainties. If Friedmann (1966) could write of "the new orthodoxy in planning" in which "...everything (is) related to everything else, of rational decisions optimizing results from all sub-systems and predictions of alternative outcomes under varying constraints", he was able to conclude only seven years later (1973) that "our inherited notions of planning are dead". The failures of the past and the need to respond to the challenge "to rethink planning from the start" in conditions of turbulence" (Godschalk, 1974) means that the lack of not only consensus views about solutions to urban problems, but an absence of agreement over the nature of the problems per se has to be our point of departure.

## Concepts and Approaches in Context

(1) We adopt an evolutionary view of society (Rose, 1974) and a tension-managing planning system, the essential features of which are:

- (a) Integrative in approach and multidisciplinary in character
- (b) Normative and self-directive; concerned with choice, preferences and goals
- (c) Adaptive to change; continuously modifying ends and means, preferences and goals
- (d) Based on adequate information and consideration of alternatives.

(2) We adopt a framework for organising study of public policies directed towards problem solving. An iterative approach which relies on mixed scanning is helpful in exploring both conceptual and practical problems associated with monitoring at different stages of the process, and at different levels of organisation and implementation. (Etzioni, 1968)

We now consider (a) some definitions and (b) categories of monitoring.

- (a) What is monitoring? It should be seen as an integral part of an iterative planning process; it has little meaning in itself. There have been many definitions (Forrest, 1976) but ultimately, it depends upon the nature of the pro-

blems and the attempt to resolve them, i.e. the decisions to be taken. It is the periodic recording of selected information to show how a system of plans and policies is performing in the achievement of its stated objectives; a selective process by which statistics and information are directly related to policy decision and the assessment or failure of plans in action. (Bor, 1974)

A similar view (Layfield, 1973) is:

"...a continuing and co-ordinated system for the collection, analysis and publication of data. Its purposes should be to inform authorities and others of the success or otherwise of policies so that the need for change of policies together with a sufficient basis of fact to enable the effect of such changes in themselves to be forecast".

(b) Three types of monitoring may be identified which relate both to degrees of uncertainty in the environment and degrees of control in policy terms:

- (i) Implementation monitoring
- (ii) Impact monitoring
- (iii) Strategic monitoring

Implementation monitoring has been practised for a long time. It assumes a stable and well-understood environment and a high degree of control. Events are charted and the approach is unitary.

Impact monitoring also tends to be associated with development planning and unitary approaches. Nevertheless, major developments such as a National Exhibition Centre introduce a strategic element. A process called commitment planning has been developed for reducing the formidable risks of urban development. (Apgar, 1976) The commitment plan is selective, focusing on a handful of key performance indicators and "make or break" activities. It is geared to economic and market uncertainty (MacMurray, 1974). Implementation and impact monitoring are interactive and sometimes overlapping.

Strategic monitoring has been the object of most study directed towards the understanding and categorisation of uncertainty, and on learning processes and adaptive approaches.

In the context of structure planning and review, the practical distinction between general monitoring and monitoring the development control system is useful and this is discussed further.

#### Elements Influencing Techniques

The main contextual elements which influence the choice, development and utilization of monitoring techniques are:

- (i) (i) operational
- (ii) technical
- (iii) theoretical

(i) The operational context tends to constrain the development and application of techniques for a variety of reasons. Turbulence in the policy environment may be combined with political and administrative inertia, frustrating all attempts to make policy objectives clear and operational and hence capable of review and revision through time. There are objective institutional limits within which planners must work. The professionals share with the wider polity,

the prevailing concepts of what constitutes the "public interest" and preoccupations with notions of equality, liberty, social justice and conservation rather than technology. (Gregory, 1971)

(ii) The technical context which allows for the classification of techniques for both descriptive and prescriptive purposes, reflects the methodological problems which arise in monitoring and review. It is in the recognition and resolution of these problems that one can locate the requirements for improved techniques.

(iii) The theoretical context tends to determine the validity and use of techniques by reference to the values and assumptions which underlie them. The definition of strategic issues, for example, introduces the notion of adaptive changes over time, emergent properties which are processual; real problems of content; environments which require unitary as well as adaptive approaches to planning and design. Metropolitan-wide environments raise specially difficult problems of judgement of aspects of that environment, whilst the whole question of the definition of social response is extremely problematic. (Sinclair, 1976) It follows that classificatory schemes for differentiating between the environmental elements which it is necessary to review are essential.

We may conclude that the preoccupation with monitoring and review is as much a practical consequence of the inability of plans and policies to cope with change and uncertainty, as it is a result of advances in theoretical understanding. Plans become obsolete in at least four main ways:

- (i) It is impossible to keep track of all the assumptions which go to make up a forecast.
- (ii) Planning controls are slow to take effect while social and economic change may take place quickly.
- (iii) The effectiveness of planning controls over time varies.
- (iv) The values of society may change over time resulting in a need to change the objectives of a plan.

The main issues are related to uncertainty on the one hand and control on the other. Uncertainty reduces control. Institutional and administrative arrangements constrain control. Ideological preconceptions may mislead. It is evident that different types of monitoring are appropriate to different levels of decision. (Antony, 1965)

Some of the problems would become more tractable if it was recognised that the areas within which successful review and monitoring were possible are objectively limited by the nature of the planning system and the institutional framework. (JURUE, 1977)

### The Planning System and Institutional Framework

There are four principal aspects:

- (i) The reorganised framework of local government
- (ii) The post 1971 planning system
- (iii) Structure plans and changing planning processes
- (iv) Corporate management

(i) There has been a well-defined trend towards larger and more uniform administrative units and towards the grouping of local authorities for specific purposes, If the dangers in the growth of centralised power have been noted in the past, the



extent of environmental impacts associated with that growth in related policy fields has been underestimated. The relevance of monitoring in this context is self-evident.

The Development Plans system introduced with the 1971 Town and Country Planning Act together with the 1974 reorganisation of local government brought into being a strategic and local system of physical planning. But whereas the recommendations of the Planning Advisory Group, whose Report on the Future of Development Plans (1965) had been written on the assumption of a reformed local government system based on unitary all-purpose local authorities, the 1972 Local Government Act introduced a two tier system in England and Wales.

But these changes did not only have their rationale and justification in the past, they were a reflection of future aspirations deriving from beliefs in rational models of organisational behaviour and perhaps an over-confident assumption that the emerging urban problems could be handled by an increasingly interventionist approach. There appears to be little awareness of the problems of two-tier reorganisation, notwithstanding the problems faced by Greater London which had been reorganised in this way some nine years earlier. (Rose, 1977)

One effect of local government reorganisation has been to reduce the number of local authorities from 1391 to 422, but the number of planning authorities has increased from 141 to 422. The most important characteristic of this new separation and division of powers and responsibilities between tiers, especially in the metropolitan regions, is the tendency to duplication and overlap of functions.

(ii) The post 1971 planning system, introduced some six years before local government reorganisation introduced a more strategic "broad brush" approach consisting of structure plans, the responsibility of metropolitan or rural counties which must be accompanied by public participation exercises and consultation processes embracing the lower tier districts, before approval by central government, and local plans which do not require central government approval.

(iii) The overall purpose of structure plans is to set out policies and proposals for the use of land; to resolve conflicting pressures for and against the use and development of land; to guide prospective developers, inform the public and facilitate speedy decisions on planning applications. In addition, plans will guide the future operation of the Community Land Scheme. Government considers that only issues of genuinely strategic importance should be included, concentrating on the essentials, and realistic estimates of resources available.

By 1974 planning was seen as a "continuous process which is not completed when a plan is produced" and monitoring functions as mechanisms aiding effective decision making, to observe, comment on, react to and guide the implementation of policies and plans. Structure plans were to be capable of being continuously monitored and reviewed as necessary. (DOE, 1974)

(iv) The prime justification of these reforms was perhaps co-ordination. There was a widespread belief that institutional change would lead to improved methods of providing local government services and integrated or corporate forms of planning. Many authorities introduced new management structures and attempted to adopt new planning mechanisms.

Since reorganisation, the function of a metropolitan corporate planning organisation may be seen as primarily directed towards identifying needs in the broad sense, fulfilling an intelligence and information role, setting out the issues for discussion and strategic choice. Planning functions which are not primarily concerned with spatial location and land allocation are not discharged by the physi-

cal planning department. Indeed, where corporate organisation is powerful, the department discharging statutory responsibilities under the planning acts is more circumscribed in its activities..

### Interim Assessment

Whilst the statutory requirements of the 1971 Town and Country Planning Act and experience suggested a relatively limited role for the structure plan, it tended to be viewed by many as a vehicle for an integrated or corporate planning approach directed towards economic and social problems. In fact, the structure plan is no more than a special strategic plan concerned primarily with land; a spatial index of where and when development will take place; with a time scale longer than the budgetary cycle or the short term horizons of a local authority corporate programme; concerned above all with the structural and spatial dimensions of the area which it covers; an expression of all the other non-spatial policies.

The promise of the new system has not yet been realised and more corporate approaches have yet to be shown to be effective. The early enthusiasms and mechanistic adoptions of systems have been tempered by a growing understanding of what has been called problems of strategic choice and the inter-corporate or inter-agency dimension. (Friend and Jessop, 1969) There are three potential areas of conflict over control of the monitoring process and research and intelligence. The first and most serious is inter-authority and stems in part from the powerful nature of metropolitan districts and in part from genuinely perceived conflicts of interest; the second is inter-departmental; and the third is inter-professional.

Finally, monitoring at the level of the various economic planning regions is emerging as a factor of some importance. The various Regional Economic Planning Councils have produced strategic plans for their regions which are advisory in nature though approved by central government. In the West Midlands, and it is likely the Northwest will do likewise, joint monitoring machinery has been established to monitor the regional picture and update the strategy by annual reports. The joint teams are drawn from Central Government under the auspices of the Regional Economic Planning Council and the County Council.

## OPERATIONAL PERSPECTIVES

### Some Lessons for Structure Planners

A strategic plan by definition assumes broader objectives and longer time horizons. But for reasons already touched upon such plans as have been prepared were out of date before they were printed. Only seven structure plans had been approved - excluding Greater London - by September 1st, 1977, since the passing of the Town and Country Planning Act, 1971. A further 33 had been submitted for approval and 39 were still in preparation. Further, it must be admitted that land use planning approaches rest on social and economic data which is not amenable to the preparation of convincing problems for evaluation. At the same time, public policy makers have tacitly recognised that the most critical human problems, especially in the sphere of house provision and deprivation, are largely not susceptible to solution via the public planning system as currently constituted.

Plans from the Greater London Development Plan onwards - but especially that plan - have tended towards the over ambitious. (Panel Report, 1973) That plan assumed that its policies could alter settled population trends, and in employment it tried to forecast supply and demand for substantial periods ahead and to translate these into terms of floor space allocations for various sectors of London. In fact, no

local authority policies could possibly change settled population trends in the short term and the GLC had neither the information to make employment forecasts nor the ability to relate them to floor space.

Local authorities tend to concentrate on those proposals about which they have information. Repeatedly, there is a failure to relate information to policies. In such cases, any notion of monitoring the implementation of such policies may be abandoned at the outset. There is often no way of understanding why the facts such as they are lead to the proposals set out in the plan. When faced with a variety of solutions to a problem, local authorities often tend to choose one on political grounds and then present it as inevitable. Of course, political considerations should form part of the planning process and reflect political principles. But the choice should never be presented as inevitable, it should be presented as a choice preferred for political reasons amongst alternatives, and not represented as the only logical consequence of technical information. If policies are not related to aims, no useful conclusions may be reached whether policies are necessary or likely to be successful. Monitoring should measure progress in achieving programmes; such monitoring will only achieve its full significance if the results of it can be placed alongside the proposals in a plan and comparisons made. If a plan is to be of practical use it must go hand in hand with a process of collection, analysis and publication of data which will enable those who need or wish to know to find out whether the aims and targets of the plan are being achieved. If they are not it should provide the basis for decisions on the way in which policies should be changed. (Panel Report, 1973)

#### Problems of Information and Management

Problems of information may be reviewed under five broad heads:

- (i) Conceptual frameworks for data organisation. A systemic view emphasises an interaction rather than causal paradigm.
- (ii) Data availability. Spatial and temporal compatibility.
- (iii) "Soft" non-quantifiable information in the monitoring process.
- (iv) Potential of data systems.
- (v) Analytical content and predictive value of data.

The institutional context and management structure are critical factors in designing an appropriate information base to serve an organisation. We must know what we are monitoring and why. Moreover, on the evidence of local authority experience to date it seems essential to prepare planning proposals, policies and programmes in a form that allows the organisation to monitor and review progress in achieving these self same objectives. The data base must inform the continuous process plan, and data functions rather than data systems describes more accurately current preoccupations. Data capture, its analysis and presentation as meaningful output is important.

The varied and changing information requirements of county planning departments suggests that whatever the role of a planning agency, up to date and accurate knowledge about what is happening is vital, if difficult to secure. (Essex CPD, 1968) Recognition that current awareness of housing and land availability, and of the completion of new dwellings, was the first priority, led Essex County Planning Department to adopt a pioneering approach in developing a capability for handling point and area data computer programmes. This authority also carried out pioneering work in attempting to use output from land availability information files in population prediction models. What is especially interesting is that work in Essex and elsewhere has led to the idea of a continuous review of the structure plan on an annual basis, closely linked to resource allocation and annual budgetary

procedures.

### General Monitoring and Monitoring the Development Control Process

Strategic planning functions require a general activity of monitoring recognised in DOE Circular 98/74. Simply monitoring the control of development is not of itself monitoring the planning process. (Steeley, G.C., 1976) The adoption of an annual review approach requires a general monitoring capability and may be described by its outputs; annual, quarterly and occasional reports. Annual reports may chart changes in population, housing or employment, as part of the continuous review of assumptions upon which policies are based. Quarterly reports may well be on key topics such as housing, industry, offices or shopping. Occasional reports may relate to an unexpected proposal such as the impact of a decision to build a new automobile plant in Wales.

The Review of the Development Plan System (Dobry, 1975) again raised the sensitive issue of delays in processing development applications. There is a growing feeling that planning authorities with low standards of performance may need to be brought into line through an inspectorate system (Steeley, 1976).

The fact is that monitoring development control records would produce a wealth of information and could mean evaluating,

- (i) the effectiveness of the control in relation to the Authority's objectives and policies, notably the development plan, and
- (ii) the efficiency of the process itself, the avoidance of delay and cost-effectiveness.

Nevertheless, systematic monitoring of development is not widespread. Basic weaknesses are that coherent inter-authority comparisons may not be made with the data available. Nationwide information on time and costs is probably needed, but even then statistical information does not adequately relate to "workmanship" and "integrity". These terms emphasise the qualitative dimension of control and even where figures of time taken are available they do not measure "delay" still less provide explanations.

Practical problems remain with the provision of land use data which needs to be in a form which:

- (i) allows a continuous review of development planning policy
- (ii) facilitates links with information on other issues
- (iii) permits the aggregation of local authority data to meaningful national totals.

Current work is directed towards designing such a classification system which is both cheaper and more flexible than conventional approaches.

### Contemporary Practice

Monitoring and Policy review at county level. Review procedures where systematically pursued, attempt to respond both to concepts of continuous process models and corporate approaches. In this brief overview we draw on information, from authorities where monitoring is seen as an integral part of the process itself. The main lessons to be drawn from experience to date are:

- (i) The continuing planning process of both strategic policy development and

implementation is the major function of the planning department and the structure plan is the product of this process, but whilst it must be approved by central government at regular intervals, it must nevertheless be continuously amended and updated so that it is not a "one-off" document.

(ii) The monitoring and review functions are central to this planning function, and should be an integral part of the process.

(iii) The internal organisation of the Department should be adaptable and reflect the functions it possesses.

(iv) The process itself is seen as cyclical, and must possess a regular annual focus bringing together diverse agencies involved in strategic planning; in the case of many authorities this is seen as an annual statement of strategic planning policy which would not require central government approval as such.

(v) In so far as County Councils are an implementing agency, the short term resource allocation systems must be integrated with the continuous planning process, if that process is to stand any chance of influencing the actions of other agencies.

South Yorkshire (Howells and Smith, 1977), Hertfordshire (Steeley, G.C., 1976), and East Sussex (Parker, 1976) all advocate an annual statement of strategic planning policy in which not all issues would be reconsidered each time. There would be annual up-dates of surveys previously carried out, quarterly reports on implementation progress and economic review, and monthly bulletins on various matters. East Sussex has already explicitly adopted an annual Review procedure as a response to uncertainty. This approach aspires to co-ordinate investment intentions and demands close integration with the budgetary cycle of authorities' activities. East Sussex produced the First Annual Review of the Plan in January, 1976 based upon monitoring reports which were ready in August 1975. The work programme specifies those aspects of the Plan which need monitoring reports to be prepared.

South Yorkshire's emphasis on the Draft Annual Statement is likewise directed towards budgetary considerations and information scanning undertaken the previous year. The Statement acts as a framework, both for drawing up financial guidelines for the corporate and financial plan, and for the policy preparation of that plan and the transport programme plan. The final form of the Corporate and Financial Plan and the Annual Statement would appear together at a later point in time and form the basis for another planning cycle to begin.

But problems remain in that Structure Plan policies once approved, can be amended only in accordance with the appropriate provisions of the 1971 Town and Country Planning Act. Statutory procedures assume a different time cycle and whilst structure plans remain statutory, county councils will only be able to make minor amendment or adjustments, pending a statutory review. Authorities, may have to accept the requirement to reassess their plans and policies on a broader front every four or five years for the benefit of central government's longer term resource allocation purposes, at the same time as they attempt to develop a more process oriented mode in which strategic monitoring and review play a central role. Practitioners agree that ongoing review is a relatively new activity and the schemes in operation must "be seen as essentially preliminary in nature".

Policy and information functions at district level. Leicester City is a second tier district. It is remarkable how many planning departments of any size have a separate or specialist team labelled "research", "intelligence", "strategy", "policy" and the like, whose job description includes "monitoring as an explicit role". Leicester is no exception with a small team charged with the development

of monitoring activities and the continuous review of city-wide policies under the Planning Acts, and indeed, many phenomena outside the ambit of those Acts. This team provides intelligence on population, housing, land-use and transportation. They have developed "systems" for some of these activities and have recently extended their role into the fields of monitoring the economic performance of the City, and are exploring ideas for "social" or "welfare" monitoring. They are further charged with monitoring "techniques" in planning and advising on their use and introduction into the work of the department. They are very much aware of the need to assemble and report on qualitative and subjective evidence as well as the statistical and they try to keep abreast of the policies and actions of the many agencies whose roles overlap those of physical planners in obtaining desired change.

New forms of plan making are emerging in related fields. The Transport Policy Plans and other "policy programmes" are being developed in relation to housing improvement, and may be extended in the context of inner city policies for providing local employment.

#### TECHNICAL AND INFORMATION ASPECTS

##### Some Operational and Technical Characteristics of Monitoring

Operational and technical problems arise in attempting to establish links between policies and feedback; learning and feedback give the dynamic to the process and information which is produced at all stages of the process changes the process itself. The characteristics of monitoring systems may be discussed under three heads. (Barnes, 1976)

(1) The work carried out in Monitoring the Impact of the National Exhibition Centre (JURUE, 1976) underlines the main operational criteria which may be summarised:

- (i) Information and monitoring must have some defined purpose which is usually associated with a policy or with a role in the general planning process; attempts at accuracy and comprehensiveness do not outweigh analysis and interpretation.
- (ii) It must be possible to formulate adequate measures of the key policy or planning variables. It is also important to be able to compare trends. Selected information will date and needs updating for continuous policy review.
- (iii) Measuring tools must measure what is required. Measures must be able to detect unforeseen consequences.
- (iv) Data must be readily available and readily comparable over time. This has implications for data and information generated within departments.
- (v) Efficiency requires the reduction of lead and lag times and performance indicators.
- (vi) It must be possible to distinguish changes in the variables due to policy and planning control, from changes due to other influences on the variables. This raises fundamental problems of causation.
- (vii) Costs of monitoring must be related to other resource costs and demonstrate some degree of net benefit.

(2) We would emphasise the stages of the monitoring process rather than attempt a description of a system. What is important is the capability of any process to

review procedures as we have seen in the preceding section. Hertfordshire's approach illustrates the main stages. What is needed is the definition of policy areas clearly related to in-house information. The identification of possible departures requires an evaluation of deviant trends to assess significance.

It would seem that no local authority claims to have a fully operational monitoring system. South Yorkshire's structure plan and range of policies are broadly conceived in terms of land allocation and zones which relate to housing, population forecasts, and local plans, existing and proposed. The zones provide in spatially disaggregated terms a basis for monitoring the implementation of the plan as well as its effects in distributional terms. This approach attempts to provide in fairly detailed and spatial terms a basis for developmental control and local plans, and further to translate social objectives into spatial policies. South Yorkshire has no monitoring system as such, but the basis for monitoring is largely development control records. Qualitative aspects are not included, but there are general statements about good environment and appropriate densities in the structure plan documents. (Written Statement, 1977)

(3) There remain many problems in using indicators, the most critical being the lack of sufficient variety of indicators and the difficulty of relating indicators to policies which are constrained by the institutional, managerial, normative environment of plan making. Although target setting in strategic plans, as in respect of the housing policies for London in the GLDP, is fraught with problems related to long term time horizons, land availability, labour and financial problems and control over the private sector and a myriad of individual decisions affecting the markets, it remains a political necessity to establish such targets, however tentative and however expressed in terms of ranges of figures.

Performance indicators would not be absolute measures in any sense, but would provide an indication of relative achievement against which policies have to be measured, as such they may be used to monitor both objectives and policies. The experience of Hertfordshire and Berkshire (1976) is salutary. The objectives needing most careful monitoring are those which are most weakly linked to policies and whose achievement is more uncertain. In land use planning which is the *raison d'être* and primary preoccupation of structure planning, if the only measure of achievement that can be established is completely uncontrollable or unlikely to be changed by any conceivable strategy, then there is little point in attempting to pursue the objective by operational land use policies. (Barnes, 1976) Many social and economic objectives may not appropriately be pursued by traditional land use planning, by physical or spatial approaches. McLoughlin (1975) in a study of indicators used by authorities discovered that most are "hard" - quantifiable - relating to peoples' jobs and land. In practice, even these are not easy to formulate.

Hertfordshire has drawn a distinction between (i) performance measures and (ii) performance criteria which illustrates the practical difficulties rather clearly. Performance measures are essentially lists of information requirements by subject, for example, population and housing. The criteria provide the possibility if not the certainty of evaluating findings with some degree of analytical force and consistency. Although they reject explicit objectives on the grounds that values and community needs change they are forced to adopt a series of implicit monitoring objectives in attempting to measure the success or otherwise of policies pursued. The lack of precision is obvious. Other policies are more explicitly defined and criteria are set out offering clear guidance in relation to the means to be adopted in achieving desired ends. In other areas, policies are exhortatory and require negotiation and inter-agency working, i.e. public and private or between tiers of government.

Hertfordshire's experience suggests that intractable problems relating to achieving

housing policy objectives cannot be readily translated into a series of operational policies set out in terms of targets, explicit objectives, all related to performance measures and appropriate criteria. Problems of uncertainty and control continually supervene. On the other hand, there is a greater definition of what may be more clearly specified; what may be more closely controlled such as density standards or physical policies. Control levels specified in policy area statements allows the spatial distribution effects of the plan to be assessed through a variety of time scales and may be established from a base year. The policy area statements also include specific housing policies relevant to each area.

Berkshire County Council have adopted a different approach which recognises the dual necessity of elaborating policies so that they are translated into operational programmes with objectives and of specifying indicators consistent with reasonable interpretations of the objective statements, so as to provide sufficient information for the decision makers to be able to judge the plan's progress. This approach is the more difficult and must constitute a learning process and the development of policy indicators which have three aspects:

- (i) indicators: related to policies
- (ii) standards: criteria against which outcomes are evaluated
- (iii) assessment: a subjective judgement about the adequacy of the indicator in the light of the absence of hard data.

Berkshire's experience and the work of research colleagues suggests that operational policies referring to specified sites, planning status, and availability may be formulated with higher degrees of certainty than is generally appreciated. It is possible and desirable to formulate certain policy programmes which may be relatively easily monitored by readily accessible information. In those cases where data is less readily available the assessment expresses it. Similarly, where a "policy" is no more than advisory or exhortatory this is recognised and no indicator is possible.

#### Targets, Indicators and Core Information

Merseyside Metropolitan Council have not yet produced one single document on monitoring, but they have put forward two important ideas:

- (i) Emerging policies that constitute the structure plan and the wider strategic work of the County Council need to be constantly examined to ensure that they are in fact monitorable, and that they embody "targets" or "indicators" that are measureable through time.
- (ii) Basic information which is necessary for monitoring and which requires some considerable "lead time" to organise has to be identified as "CORE INFORMATION".

There is an emphasis on the need to assess the impact of other agencies which are relevant to the planning process and a refreshing understanding of the limited direct influence the authority has on Merseyside. The exhortatory style of the policy makers reflects their concern to ensure that central government's industrial and employment policies are "finely tuned" to Merseyside's needs. Not surprisingly, therefore, all sections of strategic planning are represented in a monitoring group.

The information needs require the County to play a major role in co-ordinating the collection of data by the districts, a role increasingly being adopted by top tier authorities and essential if the two tier system is to be made to work reasonably



effectively. Merseyside is not alone among authorities in helping in the analysis of such data, thereby gaining access to the "micro" data, which will provide a basis for its own investment decisions.

It would seem that as the emphasis shifts from policy formation to, on the one hand, specific programmes of action, and on the other, to an increasing dialogue with central and regional government, information will increasingly be required at the detailed, or micro, level, e.g. the land parcels, rather than at the broad macro level. Likewise, the role of indicators, both static ones such as environmental quality or car ownership, and dynamic ones measuring access to opportunities, become of critical importance.

Growing theoretical understanding combined with practical experience has led in the direction of rationalisation and making information already collected readily available and comparable. Following the successful implementation of a system for recording all statutory planning decisions, a comprehensive file of data on the availability of land and including servicing constraints for each land parcel for a number of uses is now being developed. Such planning decision, including building, starts and completions, will be used to update the files at frequent intervals.

Other areas receiving attention relate to the monitoring of housing stock quality and it is hoped that eventually a comprehensive, regularly updated data base will be available for the whole county. Work on a common referencing system based on segments of the road network may improve linkages between land use data on population and housing to transportation and accessibility.

Various technical frameworks are being explored by metropolitan and non-metropolitan counties alike. It looks as if the concept of "core information" will be useful in suggesting how the raw data in various key decision areas is collected and combined in partial information systems. Merseyside have five key decision areas and their framework indicates how these systems relate to and depend on each other and how the raw data is processed and analysed by them to meet the needs of the local authorities.

The implications of applying targets and indicators within a core information system are not inconsiderable. The problem over simplified concerns effectiveness and the necessity of various authorities agreeing to partnership arrangements for joint working between tiers, agreed frameworks for information projects, work programming and priority setting.

The districts generate the data, but the County has the not unsubstantial cost for research and development and provision of computing services. The authorities have different perceptions of what information is useful and of priorities. In times of budgetary constraint the abandonment of such a system by only one autonomous member is a contingency that may not be excluded. Moreover, the information services group may have a "comprehensive" picture of how the "system" fits together but there is evidence that elected members and even higher level officer groups have little or no idea of the ramifications and possibilities of such developments. Certainly, the perceptions of some districts, previously unitary authorities like Coventry or Leicester may still cherish the notion of "going it alone and attempt their own linking of computerised records".

In short, the problems may still in part be technical, but the barriers to operational development are organisational and sometimes political. The investment in time and manpower may not be realised, if at all, for years and depends in any event on the core data being available. It is not surprising that Merseyside Planners perhaps one of the best qualified teams in the country, are approaching the problems referred to with care and recognise the need for the elected members

and indeed the other district authorities to consider several options, in a descending order of relative comprehensiveness and complexity.

#### SOME REFLECTIONS AND CONCLUSIONS

Many authorities, acting upon a Government Circular (74/73) are developing "clear arrangements for the collection, use and sharing of information". Joint working has become a necessity. Cheshire has set up a Planning Information Group with co-ordination as a primary objective; East Sussex work on planning data needs seeks to avoid unnecessary duplication of surveys and is developing common land use classifications and planning application forms. Best practice seeks cost effectiveness in seeking co-ordination and economy of effort in relating information to policy as opposed to perfect information and possibly spurious accuracy.

There remain conceptual and practical problems with target setting and the use of performance measures. In practice, it is possible to be more precise about expectations at the implementation level of planning. This becomes progressively more difficult at the impact and strategic levels. (Gillis, 1974) Likewise, a large number of objectives and policies have proved incapable of quantitative expression. The widespread belief that setting operational targets is necessary for good planning is in marked contrast to planning practice and has led to some doubt whether in fact target setting is appropriate for strategic plans covering many years ahead in a situation where there is little control or where control is widely dispersed. (Wedgewood-Oppenheim, 1975) It would seem that sensing environmental changes which may affect the assumptions upon which policies or objectives are based may be more important than indicators directly linked to policies or objectives.

This emphasis on the public's reactions to policies and the highlighting of areas of public concern is both a necessary political and social objective of planning and a practical and realistic response to problems of forecasting. Political processes in and outside town halls continue to plan a much more important role than had been appreciated by those who advocated system or managerialist approaches. The outwardly connective styles of planning embracing a system of consultation with publics and agencies both formally and informally results in feedback on policies (in the plan) and elsewhere in the town hall. This ostensibly planning participation process raises issues beyond the powers of the plans and other policy instruments may be called into use or may have to be designed to respond to these social and political pressures.

Planning decisions are essentially matters of policy rather than justice. In this sense they are political and when they touch upon decisions and matters of national or regional importance, they should be subject to political scrutiny and judgement. Strategic choice raises acute problems of "measurement" of qualities which cannot be easily added or compared. The critical problem remains, therefore, to distinguish those effects caused by the plan from those which are not and to generate criteria by which those effects may be measured, which is a function of the degree to which the operational definition of objectives is achieved. It is a truism to state that more research through case study, experimental design, and monitoring of monitoring, i.e. controlled social learning, is necessary.

Our conclusions must necessarily be somewhat tentative. We appear to be learning from both theory and practice, by trial and error. The most important generalisation is that positivistic and comprehensive planning modes, together with attempts to simulate the urban system, are no longer as fashionable as they were. More modest objectives are being pursued. We have attempted to show how constrained the planning system is by the institutional framework of which it constitutes an important part. Review and monitoring at a strategic level is likely to make slow

progress even when it is related more consciously and selectively to those areas and objectives over which the policy makers have effective power and influence. This is a necessary but not sufficient condition. Technical questions of measurement and theoretical questions of valuation and evaluation remain.

A selective approach to information for monitoring is advocated which is related to key policy areas on a much more selective basis than hitherto. Much more systematic use - better use - could be made of data already collected in connection with planning applications and control functions. The importance of the land parcel remains paramount for practical monitoring purposes. Strategic plans need to be more realistic and this would facilitate a more selective and frequent updating with important gains for those concerned with policy co-ordination and more rational resource allocation procedures.

Finally, a few words on the "systems view of planning" which holds that planning, among other things, is a continuous or cyclical process of management of the environment. The underlying assumption so often made, and so simplistic that it proved attractive, was that it was possible for a community to fix upon a desirable course of events or set of objectives, and by appropriate corrective action when necessary, guide events to achieve the desired results. Monitoring and review was to provide not only the channels of feedback with which "progress" towards or "deviancy" from, the originally desired objectives was to be measured, but also the opportunity for prompt reassessments of the original objectives themselves to see if they still remained desirable or even valid.

It is hardly a coincidence that this over-arching view reached its apogee during the heady days of the U.S. space programme. But such a mechanistic view is not the way to solve planning problems nor does it provide a description of the way decisions are in fact made in pluralistic and democratic societies. Planners work within a political-economic framework. It is essentially a political activity. They work in "open ended" situations with powers which cannot possibly have the requisite variety to cover every source of deviancy and decay. Inevitably, there are time lags between deviation and correction and usually in conditions of uncertainty caused by a plurality of objectives.

Practical problems are "wicked" problems (Rittle and Webber, 1973) and are not wholly or predominantly technical; monitoring and review procedures are required which recognise this; they are part of what is being monitored and reviewed; it follows that monitoring and review functions will change over time, not in any simple direction towards "efficiency" or "comprehensiveness" - but in response to political, economic or other imperatives. It will be appreciated that our problems remain in part, but only in part, those of definition. If we can define our problems we might be better placed to monitor them in the light of the measures taken to solve or alleviate them. But it is a big "if" and our problems are not simply scientific problems; they are also political and are about beliefs; and beliefs change.

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# Policy-Planning-Implementation: The "Missing Link"

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## INTRODUCTION

A new concern has emerged among planners, policy analysts, and administrators, and those scholars engaged in developing the infrastructure of conceptual and empirical theory for the policy sciences and planning professions. This concern is with implementation: the assurance that policies or plans will actually be realized, while ensuring the quality of their effectuation<sup>1</sup>. There is little evidence, however, that this concern has as yet much improved our understanding of the process which leads from the initial consciousness of a problem or need, to its eventual resolution through some form of deliberate social or institutional intervention.

Anthropologists studying the evolution of man have looked for the "missing link". Analysts of the policy and planning process have not yet started to do so: studies of policy evolution, of plan development, and of program implementation have been carried out largely in isolation. This isolation of its various stages must leave serious gaps in our understanding of what is, after all, usually a continuous and organic process. The "missing link" in planning and policy studies is the link between these stages: between the initial event or perception which is the stimulus to beginning the whole process, and the development of policy, plan-making or program design, and implementation.

This paper will focus on the relationships between policy initiation, policy and plan development, and implementation. The data for our review are provided by a number of case studies which cover various examples of this process, describing a series of related events in the form of a continuous, interdependent experience. Such studies enable us to observe aspects of these relationships which are neglected in most previous work.

Much of the work which comprises the empirical base for current theory deals with the development of policies or plans without following up on their implementation, or describes and evaluates the implementation of plans and programs with scant attention to the background of the plans' or programs' development. Case studies which cover the entire continuum from the first stimulus for a policy to its final impacts are few; it is from this limited set that the cases analysed here are drawn.

## RATIONALE FOR A CONCEPTUAL MODEL

Even a cursory review of experience in policy-planning-implementation reveals an important insight: continuity between the initial stimulus, subsequent policy development, planning or program design, and eventual implementation, is by no means a necessary attribute of this process. Many first stimuli, which might have generated policy and perhaps ultimately resulted in profound social changes, die still-born. Many policies and plans are shelved or aborted before they proceed to imple-

mentation. Some policies are implemented without plans or programs, and implementation can even occur without a formal policy or plan<sup>2</sup>.

Continuity between the stages of the policy-planning-implementation process (PIIP) is only a notional artefact of the rational planning and decision-making model<sup>3</sup>. Some studies of decision making in real-life contexts have already discovered that this continuity does not necessarily exist in the decision process, in contrast to formal decision theory<sup>4</sup>. For a serious exploration of the PIIP as the interdependent process which it is, it is first necessary to develop a model which will enable us to articulate the process and recognize all its variations and ramifications<sup>5</sup>.

The rationale for such an effort grows out of the realization that the success or failure of policies, projects, or programs, is not only the result of the plans or programs themselves. If we see implementation as the final product of an organic process beginning with the first stimulus which addresses attention to a social problem, goal, or issue, then several conclusions suggest themselves.

One is that each stage of this process will be powerfully affected by some characteristics of the preceding stage. For example, an unrealistic policy, or one implications of which are insufficiently realized, may inhibit the implementation of subsequent programs based on this policy, though the programs themselves may be well designed and competently executed. One such case is the community planning program in many American cities. In spite of dedicated efforts by many community planners, this program was playing against a stacked deck because of basic incompatibilities between a participative planning policy and its bureaucratic initiators: the city planning departments<sup>6</sup>.

Another hypothesis suggests that the progression from each stage of the PIIP is not direct, but is mediated by a complex of factors which may have important impacts on the process as a whole, and on its success or failure. The Model Cities program, which changed in essential respects between its articulation as presidential policy on the one hand, and its implementation on lines laid out by Congress and HUD regulations on the other, is a case in point. These changes had a crucial effect on the program, and, in fact, were largely responsible for what has been assessed as its failure<sup>7</sup>.

It is likely, therefore, that the identification of any such mediating factors, especially in the form of control variables, could make a significant contribution toward enhancing the effectiveness of planning and policymaking. A selection of adequate case histories is beginning to be available to provide the raw material for such an analysis<sup>8</sup>, but this paper will confine itself to using the cases as an empirical base for the development of a model without which such an analysis would be impossible.

### The Cases

Sixteen cases describing processes of policy-planning-implementation (or, in some instances, non-implementation) were chosen for review. This group of case studies does not constitute a sample in any sense of being a representative set of a larger population, from which one can make rigorous generalizations. At the same time, the cases were chosen with some criteria in mind:

- They were "there". In other words, they were chosen from the available set (still rather small) of complete and detailed studies which follow the PIIP from beginning to end<sup>9</sup>.

- The range of cases was designed to include examples of the process at each of three levels of government and intervention: federal or national, state or regional, and local.
- Cases were selected to illustrate as many types of intervention as possible. These include reorganization policies, programs, and physical projects.
- Selection of cases was closely related to the development of the PPIP model presented below. Accordingly, each significant variation of the model is represented by at least one case!<sup>10</sup>.

The cases are displayed in Table A. Their numbers and ordering reflect the above criteria. The first digit indicates the type of PPIP model variation which the case represents; these will be described in more detail. There are ten examples of the "standard" or "classical" PPIP model: where the process develops sequentially from its first stimulus to final implementation, going through the stages of policy and plan or program development. The other six are divided between the different variations on the PPIP model.

The second digit represents the combination of the other two criteria-level of organization, and type of intervention. 1-3 indicate processes at the federal or national level, respectively 1 for reorganizations or procedures, 2 for programs, and 3 for plans or projects. Similarly 4-6 indicate cases at the state or regional level, and 7-9 instances of local intervention.

#### The PPIP Model

Based on a review of the PPIP in general and the above cases in particular, a model was developed which would enable analysis of the PPIP. This model presents the PPIP as a sequential process which may be continuous from its beginning as the result of some stimulus (STIM) and through its stages of policy development (POLICY), planning or program design (PLAN/PROG), to its conclusion in implementation (IMPLTN). Each stage is linked to its predecessor by a complex of factors expressed as "Link" 1, 2, and 3, but each of these links also opens a number of alternative paths the process can take at that point!<sup>11</sup>.

The alternative paths open for the PPIP to and from each "link" in the model are:

1. From the preceding stage
2. From any other earlier stage, without including the preceding stage
3. From any subsequent stage or to any preceding stage (feedback)
4. To the following stage
5. To any other subsequent stage, without including the following stage.
6. To "premature" completion of the process (STOP).

This conceptual PPIP model (shown in Fig. 1 below) allows us to follow the process in any of its possible variations.



TABLE "A": PPIP CASES

CASE	DESCRIPTION	STIMULUS Description	Locus*	IMPLEMENTATION	
				Comments	Comments
0101	PPBS Planning-programming-budgeting, US federal government reorg. 1967-70.	Systems analysis in Pentagon	I	Yes	Formally implemented but limited impact
0102	MBO "Management-by-Objectives", US fed. government reorganization 1973-74.	Management theory - private sector	I	Yes	Limited implementation, soon "faded away".
0203	PCE Peace Corps: US government organization; founded 1961, still active.	Current idea; campaign promise	I	Yes	Successful implementation and institutionalization
0204	EDA Economic Development Administration US regional development(Oakland, Ca.)	Rural unemployment & poverty; campaign prom.	I&E	Yes	Smaller scale than planned; limited impacts
0205	MOD Model Cities Program: USA, central cities poverty areas 1967-72.	Urban problems; current social theory	I&E	Yes	Wide implementation but judged failure
0306	NEW New Towns planning & development: UK nat'l policy and program 1946-pres.	"Garden cities" idea; housing shortage	I&E	Yes	Successful implementation; now part of national scene
0307	BRAZ Brazilia: new federal capital, Brazil planning & development, 1950-60	National ideology hinterland development	I&E	Yes	Successful implementation; plan has some faults
0508	GBO "Governor's Branch Office" ombudsman program, Penn., USA 1968-71.	ombudsman concept; campaign promise	I&E	Yes	Implemented but little success; soon abandoned
0606	LAKH Lakhish regional development project, Israel, 1955-60.	National security needs immigrant absorption	I&E	Yes	Successful implementation model for later projects
0910	BART Bay Area Rapid Transit: San Francisco bay region, USA	Traffic congestion planning concepts	I&E	Yes	High unplanned costs; long-range impacts still unknown
1211	SUBS Suburbanization, USA, 1945-60; subsidized by federal programs.	Post-war housing needs demographic trends	E	Yes	Nonpolicy, but massive impacts of uncoordinated federal programs.

\*I: Intraorganizational locus

E: Extraorganizational locus

(cont'd on next page)

TABLE "A": PPIP CASES (cont'd)

<u>CASE</u>	<u>DESCRIPTION</u>	<u>STIMULUS</u> <u>Description</u>	<u>Locus*</u>	<u>IMPLEMENTATION</u> <u>Comments</u>
2212 HUD	"Fair-share" housing planning policy US Dept. of Housing & Urb. Dev.	Perceived inequities social theory	IE,E	Yes Successful implementation and institutionalization
2913 RACN SS	Neighborhood revitalization plan, Racine, Wisc., USA, 1968-73.	Civil unrest neighborhood decline	I&E	Yes Parts of plan implemented; other unplanned implementa- tion.
3314 3LON AP	Site for 3rd London airport; Roskill Commission, UK, 1968-69.	Projected congestion long-range planning	I	No Recommendations rejected; "Policy Abort" model
4315 HOOK	Hook New Town plan, UK 19 (in context of British new towns pol.)	New Towns policy	I	No Plan abandoned due to local resistance; "Policy-Plan Abort" model
5916 RYE	Residential development project	Development potential	I	No Project dropped: local opposition & econ. slump; "Plan-Abort" model

\*I: Intraorganizational locus

E: Extraorganizational locus

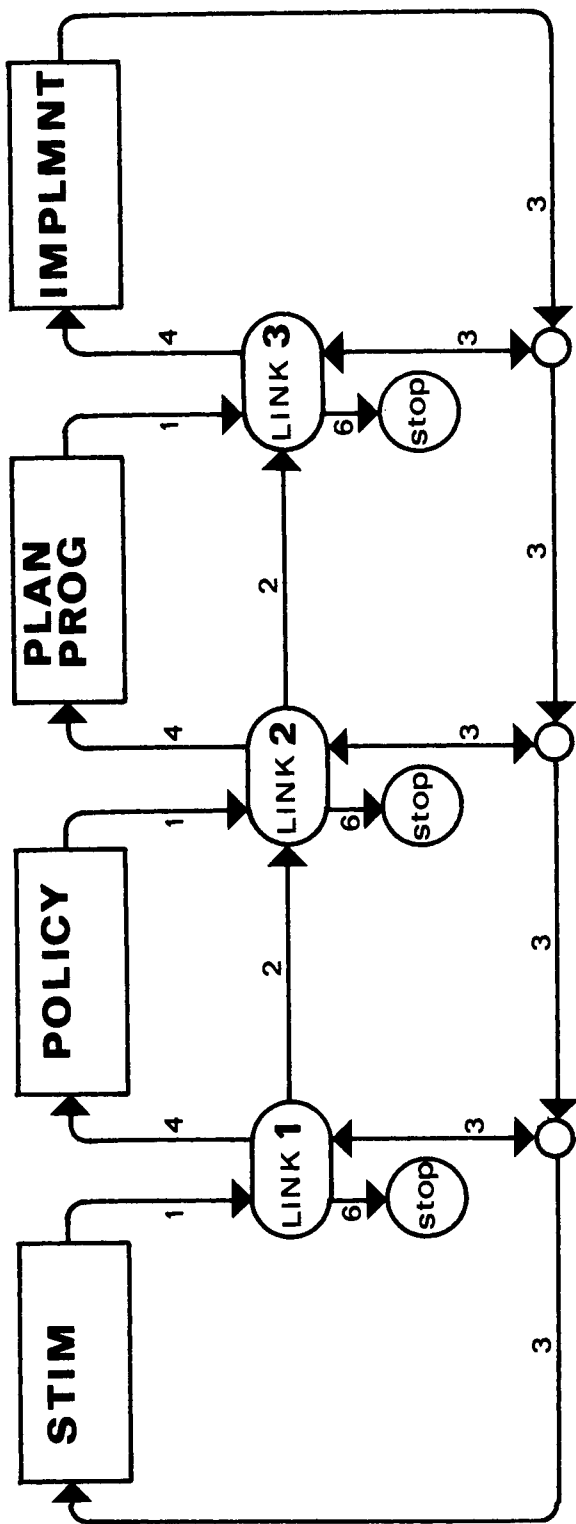


FIG. 1 The Policy-Planning-Implementation Process

### Variations in the PPIP

The conceptual PPIP model developed here enables a more systematic examination of the deviations from the sequential and continuous process proposed in "classical" planning and decision-making models. Some of these deviations are known to any of us who are involved with real-world plans or policies: the policies that are aborted and the plans that are shelved. Other variations may seem paradoxical or counterintuitive, but that they exist in fact, and not only as theoretical possibilities, will become apparent from the case material. The full range of variations in the PPIP model is as follows:

- The Standard of "Classical Model (0)

(STIM, 1.1, 1.4, POLICY, 2.1, 2.4, PLAN/PROG, 3.1, 3.4, IMPLMNT). This is the continuous sequential model which matches normative theory, and which is represented by those cases where the PPIP runs its "normal" course from its initial stimulus to its completion in implementation. Ten of our cases represent this sequence, though in the degree and quality of their implementation they differ. They range from federal policy directives like the implementation of PPBS and MBO, through national programs which were implemented, with some successes and some failures, such as the Peace Corps, the Economic Development Administration (EDA), and Model Cities in the U.S., Britain's New Towns program, and Brazil's new capital city of Brasilia, to state, regional, and local interventions such as Pennsylvania's "Governor's Branch Offices" (GBO's), the regional development of Lakhish in Israel, and the rapid mass transit system (BART) developed by the San Francisco Bay area.

A preponderance of national efforts among the above examples perhaps reflects a general phenomenon: with policy and resources becoming increasingly centralized, much regional and local intervention takes place as a subsequent stage of national policy. Consequently less policy originates at the sub-national levels, though of course planning at these levels will be responsive to local stimuli. Examples of this process are the urban renewal program of the 1950's and '60's in the U.S., urban neighborhood planning in Israel, new towns planning in the U.S., in the 1930's, in Britain, and in Israel<sup>12</sup>.

This variation in the process is more appropriately expressed as a "subroutine", which we might call the "Plan/Program Subroutine". Here existing policy is the stimulus, so the sequence would be: STIM=POLICY, 2.1, 2.4, PLAN/PROGR, 3.1, 3.4, IMPLMNT. This subroutine of course expresses a wide spectrum of planning and program design activity, which occurs as a result of national policy and resources.

- The "Non-Decision":

(STIM, 1.1, 1.6, STOP). It is easy to conceive of cases where the stimulus exists for the potential initiation of the PPIP, but its development was inhibited by circumstances, or it was nipped in the bud. Political theorists have described this as the case of "non-decisions", where powerful groups or a dominant ideology set the agenda for those decisions which are actually made, limiting the actual range of potential policy issues<sup>13</sup>. Naturally, there are difficulties in developing case histories of non-decisions, though some attempts have been made in this direction<sup>14</sup>. While it is satisfying to note the congruence between this model's predictions and political theory, the case of "non-decisions" is rather marginal for the PPIP.

- The "Invisible Hand" Model (1):

(STIM, 1.1, 2.2, 2.3, 3.4, IMPLMNT). Examination of the PPIP model suggests that there does not have to be a necessary connection between a social stimulus and policymaking or planning to effect its implementation. In certain circumstances social needs might be met or problems solved without the deliberate public intervention responding to that particular stimulus which is implied in the PPIP.

Here we are not referring to broad social movements like the Industrial Revolution, or to the results attributed to the "invisible hand" of the economic market. This model implies an "invisible hand" in the policy area, when public actions, sequential or simultaneous, result in outcomes similar to those which would result from deliberate policy or planning.

Such a case of unplanned implementation is presented by William Baer in "On the Making of Perfect and Beautiful Social Programs"<sup>15</sup> where the post World War II movement to the suburbs in the U.S. is described as largely the product of a number of uncoordinated programs, some, like the Federal Highway Fund, VA loans, and home loan interest tax rebates, representing massive public investments. Though each program was in response to different stimuli and different interests, together they had a synergistic effect which could not have been more powerful if suburbanization had been deliberate public policy.

Of interest is the question: when do a set of stimuli result in this kind of direct implementation, rather than eliciting a deliberate public policy response. To answer this question we need to examine the differences between the stimuli which produce different PPIP models, and analyze the factors affecting the link between stimuli and policy making. This will be addressed below.

- The "Direct Planning" model (2)

(STIM, 1.1, 2.2, 2.4, 3.1, 3.4, IMPLMNT). Two of the cases reviewed here do not fall into the "standard" PPIP model, although they incorporate a well articulated planning stage and resulted in plans and programs which were to a greater or lesser degree implemented. Both lacked the phase of policymaking, but instead passed directly to relatively detailed planning.

The one example is the development of HUD's "Fair-Share" housing requirements, which originated within the Department of Housing and Urban Development<sup>16</sup>. The other is a case of local neighborhood planning, in Racine, Wisconsin, where the articulation of community needs and their resolution in a plan proceeded almost simultaneously<sup>17</sup>.

Each of these cases is typical of a class of PPIP's. The HUD case represents the situation where an institution turns to planning for a particular need on its own initiative, and succeeds in pursuing its effort to successful fruition. Much project planning by local governments follows the same PPIP model.

The Racine case is an example of a slightly different situation, namely where the planning process is initiated as the result of an exogenous stimulus. This is also typical of a good deal of local level planning. Later we will contrast this model with the case where the plan is abandoned before implementation, to identify the salient factors responsible for the difference.

- "Policy Abort" (3)

(STIM, 1.1, 1.4, POLICY, 2.1, 2.6 STOP). Up to this point we have examined variations on the PPIP model which all link the original stimulus with eventual implementation. Now we come to the cases where for some reason or other this process is interrupted and aborted. Each link represents a potential point of failure and diversion of the process to premature conclusion. The "non-decision" situation described above is one such possibility, when already at the first link the stimulus is diverted before it can be expressed as policy.

In more concrete terms; the next point at which there exists the potential for failure is link 2, which connects policy with planning or programming. Such cases as everyone knows, are legion, though few of them are rigorously documented: it

is an ungrateful task to be the historian of failures. Nevertheless, in all countries the legislative arena is a graveyard of policy aborts, not to mention the numerous instances of abandoned policy initiatives on the part of interest coalitions and public agencies.

Many are the cases where policy development has been highly institutionalized and well articulated, only for the recommendations that emerged to be sidetracked or shelved. One of our cases is a well documented example of this process: the Roskill Commission's Report on the site for a proposed third London airport<sup>18</sup>. The Commission's recommendations, arrived at after an extended analytical process, were not adopted and no third airport has been planned to date.

What are the differences between these cases and the ones where policies were successfully transformed into plans, and implemented? Our model enables the identification of two potential points where some combination of factors can affect the continuation of the process: the delayed effect of some factors at link 1 or link 2. Apart from these, the fate of the PPIP could also be affected by characteristics of the stimulus or the policy itself.

- "Policy-Plan Abort" (4)

(STIM, 1.1, 1.4, POLICY, 2.1, 2.4, PLAN/PROG, 3.1, 3.6, STOP). Just as the PPIP can be sidetracked after the development of policy, the same thing can happen after the completion of planning or program development. Here the characteristics of the projected plan or of the proposed program, and the factors involved in link 3, provide additional potential points of failure.

Again, such cases are widespread, though the well documented instances usually involve planned projects, rather than programs. Perhaps this is because of the more prominent nature and larger scale of such ventures, and the relatively massive public investments in planning which ensure wider notice when such projects go down the drain. Program development is usually more modest, and can be quietly written off after some bureaucratic sighs in the depths of some public agency. This is more difficult, for example, with a project like the San Francisco Bay's "Southern Crossing" bridge, which represented a \$6m. investment in preliminary design alone before public opposition forced its abandonment.

The plans or programs in the "Policy-Plan Abort" model cannot be only looked at on their own, but are the descendants of policies which may be successfully implemented in other planning efforts. The case reviewed here is an example of this. Hook was a new town which was planned for a location in Hampshire as part of Britain's New Towns policy, a policy which has seen many successes to date. The plan for Hook, too, was a model of its kind, and, though never carried out, became a textbook example of skilled and imaginative planning and profoundly influential on the succeeding generation of British new towns<sup>19</sup>. Unlike those, however, Hook was never built; later we will examine some of the factors which may account for this apparent anomaly.

- "Direct Plan Abort" (5)

(STIM, 1.1, 2.2, 2.4, PLAN/PROG, 3.1, 3.6, STOP). Perhaps commonest of all are cases of "Direct Plan Abort"; local projects that fail to be executed, master plans that are never approved, agency developed program proposals that never see the light of day. Again, though knowledge and experience of these cases is widespread, documentation is rare.

Often the only evidence of these efforts, apart from the memories of the participants, are the program or planning proposals gathering dust on the initiators' shelves. One example of this class of cases (drawn from the author's knowledge)

is the plan for the new city of Modi'in, which a subsidiary agency of the Housing Ministry in Israel developed in the mid-60's. The original stimulus for this effort was an idea of the then Defence Minister, Moshe Dayan, to construct a city of over 100,000 in the Judean foothills south-east of Tel Aviv. This would serve the dual purpose of relieving the population pressure on the Tel Aviv region without using up valuable agricultural land, and closing a thinly populated security gap in the border<sup>20</sup>. This plan was never implemented: a combination of factors, was responsible, including a radical change in the political constellation.

The case reviewed here is one of the few which are described and analysed in detail: the aborted plan, proposed by the developer of Columbia new town, Rouse, for an innovative residential satellite suburb on the off-shore Maryland peninsula of Rye Island. Again, a combination of exogenous factors (such as a slump in the economy and spiralling interest rates) and characteristics of the planning process itself forced the project's abandonment.

Besides these variations on the PPIP, which we have specified in detail and enlivened with some illustrations, there are of course many other possible paths for the PPIP to follow. In our simplified descriptions, for example, we have ignored the existence, in many cases, of feedback from previous attempts which provide important input into a current iteration of the PPIP. It is important to remember that policy-planning-implementation, as modelled here, is actually a somewhat arbitrary abstraction of what is actually an ongoing, iterative and recursive process<sup>21</sup>.

A richer model of the PPIP, such as the full case descriptions reveal, provides numerous instances of feedback input into every stage of the process. The Model Cities program, for example, was shaped largely due to the cumulative effect over several years of negative community reactions to the purely physical orientation and the social dislocations of conventional urban renewal. In Israel, the Lakhish regional development plan's aim of settling immigrants in ethnically homogenous communities was a product of the failure of the previous "melting pot" policy for immigrant absorption. In Britain, the abandonment of Hook led to significant changes in the administration of the new towns policy, enabling input from local interests at a much earlier stage of decision making on the type and location of new town proposals.

## DISCUSSION

The primary aim of this paper is descriptive, not explanatory. With the development of the PPIP model, however, the foundation is laid for an analysis of the factors mediating between the successive stages of the process. Such an analysis is of more than merely theoretical interest: if continuity is not a necessary attribute of the PPIP, it must be the result of some combination of preconditions which already existed, and others that have to be created. Implementation - let alone successful realization - is generally regarded as a necessary characteristic of successful policies, plans, or programs: if they were not even carried out, they lack an essential feature of success. Consequently, for those interested in developing and successfully executing policies, plans, or programs, a focus on the creation of this continuity is indispensable.

Analysis of the PPIP can take place at two levels. The first level addresses the question: how can we explain the variations in the process from its original stimulus to final implementation or to its "premature" abandonment. To make the analysis operationally useful, and not only of interest to observers and students of planning and policymaking, it is essential to make a conceptual distinction between two kinds of factors.

One kind we may call environmental variables: these are factors over which the people actively involved in the process have little or no control. They are the product of circumstances: a program is abandoned because its sponsors were on the losing side in elections, or a plan is aborted when a higher level agency makes an unpredictable change in policy and reallocates its funds away from such projects<sup>22</sup>. The other type of factor we may call control variables: these are the elements affecting the process over which its participants have a significant degree of control: articulation of policies and plans, mobilization of allies and constituencies, assurance of resources within the bounds of the possible, and so on<sup>23</sup>.

There is a second level of analysis, no less important, but confined to a subset of cases. It deals with those instances where the original stimulus did indeed find its resolution in implementation. These are the cases, then, where the first, necessary but not sufficient, criterion for a successful policy, plan, or program has been met. The other necessary criterion is effective and successful implementation, judged by an appropriate evaluation of intended and unintended outcomes and impacts. The classification of this subset of cases into types or degrees of success or failure, could enable a search for factors affecting the links between the stages of the process, which may also be related to the ultimate quality of plan or program implementation.

It is beyond the scope of this paper to develop this analysis here in the requisite detail for a rigorous deduction of conclusions. Nevertheless, we can observe several common characteristics among subsets of the cases which have been reviewed, which relate to the development of variations in the PPIP model.

#### Stimulus and Implementation

There seems to be a close relationship between the type of stimulus which sets off a PPIP, and its chances of implementation. This is not a determinate relationship, however, but a contingent one. Six cases had a strictly intraorganizational stimulus; that is, the motivation and genesis of the process grew within the organization or institution which carried it out, on the basis of its own imperatives, and with little or no external manifestations of demand or perceived need. These are the two cases of procedural reorganization in the U.S. federal government, PPBS and MBO, the organization of the Peace Corps, and the three cases which failed to reach implementation<sup>24</sup>.

Why was policy implemented in three of these cases, and in the other three it was not? The stimulus cannot account for the difference, and other factors affecting the PPIP, environmental and control variables operating at the various links, do not vary in any systematic way. But the cases do differ in one important respect: each of the first three cases was an internal change in the institution in which the PPIP took place (the executive branch of the U.S. government) where the initiating unit, (the Bureau of the Budget or the President) had the organizational autonomy, the authority, and the resources to carry the policy through. The issue of external demand, in this situation, becomes much less relevant.

Each of the three "aborted" cases, on the other hand, dealt with issues which are highly interactive with their surroundings: a major international airport, a new town, and a proposed residential development in an environmentally sensitive area. In this context, the fact that these policies or plans were not initiated in response to some manifest need, but on the basis of planning, policy, or profit needs perceived only by the organization itself, later became critical.

It is possible to suggest a contingent relationship, then, between locus of stimulus, type of PPIP, and implementation. Internal reorganizations can be successfully



implemented even if they are the results of internal stimuli alone. But for PPIP's with wide ramifications an external stimulus is one necessary precondition for implementation.

### Links, Policies, Plans and Programs

A review of all the cases reveals a wide variation in the quality of policies, plans, or programs. This variation is not systematically related to any differences in the PPIP or its outcomes. The designs of PPBS, for example, and that of the MBO regulations, were conceptually flawed in ways that seriously inhibited the possibility of their having any significant impacts; yet actual implementation was never in jeopardy. Policies and plans of other cases which were implemented were also in various degrees defective. Conversely, several of the examples include effective policymaking and highly competent, sometimes even innovative, planning: the Peace Corps, the British new towns program, and Israel's Lakhish project, to name a few.

Among the cases which were not implemented are projects with plans that were of the highest quality: literally on the frontiers of professional practice and expertise. These are the plans for Hook and Rye Island. The Roskill Commission report was also produced using advanced analytical techniques, though it ignored a critical part of its terms of reference, an omission which sowed the seeds of its rejection. It is clear, then, that competent, well articulated and internally consistent (if not innovative and imaginative) policies, plans and programs may be important for eventual success, but these qualities are not even a necessary, let alone a sufficient, requirement for implementation.

On the basis of such a small sampling, such a finding cannot be anything but tentative. Its implications are sufficiently serious, however, to warrant further research and more rigorous analysis. This negative finding, too, enhances the importance of examining the PPIP as a whole: it is in the links between its stages that there appears to be the best prospect of identifying the salient factors (if there are any) which may affect the direction and outcomes of the PPIP. It is hoped that the development of the PPIP model presented here will stimulate enquiry into this question.

### NOTES

1. Jeffrey Presman and Aaron Wildavsky, Implementation (Berkeley, Ca.: University of California Press, 1972) note the lack of concern about implementation, which they substantiate with a review of the scanty literature on the subject. A radical change of posture is observed by Walter Williams (Jr.) and Richard F. Elmore (Eds.), Social Program Implementation (New York: Elsevier, 1976) p.3.
2. This statement may seem paradoxical, but it will be supported below.
3. For examples of such models, see Irwin D.J. Bross, Design for Decision (New York: Free Press, 1953), pp. 18-32, Andreas Faludi, Planning Theory (Oxford: Pergamon Press, 1973) pp. 60-75, Nathaniel Lichfield, Peter Kettle and Michael Whitbread, Evaluation in the Planning Process (Oxford: Pergamon Press, 1975) pp. 19-22.
4. See, for example, H. Mintzberg, Duru Raisinghani and Andre Theoret, "The Structure of Unstructured Decisions", Administrative Science Quarterly, 21,2 (June, 1976) pp. 246-275.

5. This aim is analogous to the goal of a similar analysis in planning, which has proved to be highly influential in the subsequent development of planning theory: John Friedmann, "A Conceptual Model for the Analysis of Planning Behavior", Administrative Science Quarterly, 12, 3 (September, 1967) pp. 225-252.
6. Martin L. Needleman and Carolyn E. Needleman, Guerillas in the Bureaucracy (New York: Wiley, 1974), pp. 322-323.
7. Bernard J. Frieden and Marshall Kaplan, The Politics of Neglect (Cambridge Mass.: MIT Press, 1975); Charles M. Haar, Between the Idea and the Reality, (Boston: Little-Brown, 1975).
8. These are the cases which are referenced below as falling under the "standard" or "classic" policy-planning-implementation model.
9. This set was further limited to those cases known and available to the author; since no systematic literature search preceded this study my impression that the existing number of appropriate case studies is small may be mistaken, but I doubt it.
10. A few exceptions to this rule, and their reasons, are elaborated on below. They are the variations called "Non-Decisions" and "Plan-Program Subroutine".
11. This conceptualization is analagous to the model of unstructured decision processes developed by Mintzberg et al. (1976), to which I am indebted.
12. New satellite towns in Sweden, Finland, and in the U.S. after the "New Deal", do not fall into this category, since they were largely the result of local policy and initiative: Ann Louis Strong, Planned Urban Environments (Baltimore: Johns Hopkins Press, 1971) pp. 1-122, James A. Clapp, New Towns and Urban Policy (New York: Dunellen, 1971) pp. 107-144.
13. Peter Bachrach and Morton S. Baratz, "Two Faces of Power", American Political Science Review 56, (1962) pp. 947-952.
14. Peter Bachrach and Morton S. Baratz, Power and Poverty: Theory and Practice, (London: Oxford University Press, 1970); Matthew A. Crenson, The Un-Politics of Air Pollution: A Study of Non-Decision Making (Baltimore: Johns Hopkins Press, 1971); a theoretical approach has been proposed by Peter Abell, "The Many Faces of Power and Liberty: Revealed Preference, Autonomy, and Teleological Explanation", Sociology 11, 1 (January 1977) pp. 3-24, for identifying non-decisions without necessarily doing a comparative analysis, but to my knowledge it has not yet been applied.
15. William C. Baer, "On the Making Perfect and Beautiful Social Programs", The Public Interest (Spring 1975) pp. 80-98.
16. Vincent L. Marando, "HUD's Metropolitan Lower-Income Housing Policy: Fair-Share Planning" in Management and Policy Science in American Government, ed. by Michael J. White et al. (Lexington, Mass.: D.C. Heath, 1975) pp. 101-127; this case is included under the "direct planning model", although HUD developed a policy, because the policy had no legislative mandate and was in fact articulated directly through regulations.
17. Ernest R. Alexander with Robert M. Beckley, Going It Alone? A Case Study of Planning and Implementation at the Local Level (Washington, D.C.: Government Printing Office, 1975).

18. Lichfield et al. (1975) pp. 271-289; David McKie, A Sadly Mismanaged Affair: A Political History of the Third London Airport (London: Croon Helm, 1973).
19. Ervin Y. Galantay, New Towns: Antiquity to the Present (New York: Braziller, 1975) p. 59; Greater London Council, The Planning of a New Town (Hook), (London: GLC, 1965).
20. Institute for Planning and Development, Modi'in Master Plan (Tel Aviv: IPD, 1976).
21. This characteristic is emphasised by Ruth P. Mack, Planning on Uncertainty (New York: Wiley, 1971) p. 148, who defined the PPIP as: "DOSRAP: Deliberative, Ongoing, Staged, Recursive, Administrative Process".
22. Such discontinuities abound, but by their nature cannot be normatively addressed by theorists of planning or policy development; evidence of such "breaks" in policy over time is offered in Otto H. Davis, M.A.H. Dempster and Aaron Wildavsky, "A Theory of the Budgetary Process", American Political Science Review, 60,3 (September, 1966) pp. 529-530, and Anthony Downs, "The Successes and Failures of Federal Housing Policy", The Public Interest, 34 (Winter, 1974) pp. 134-135.
23. Naturally, the boundary between these two sets of variables is not always clear, and our classification may have to be judgemental and sometimes based on the "wisdom" of hindsight. However, I believe that the importance of the conceptual distinction warrants this risk.
24. All the other cases had both intra- and extraorganizational stimuli.

# An Application of Non-Metric Techniques in the Dan Metropolitan Region

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## INTRODUCTION

The object of this paper is to present the application of nonmetric analysis techniques in the framework of the Dan Metropolitan Area. The analysis constitutes a preliminary stage in the planning of the inner and intermediary rings of Israel's main metropolitan area, which embraces the towns of Tel-Aviv, Ramat-Gan, Givatayim, Bene-Beraq, Holon and Bat-Yam.

The first models of nonmetric analyses were developed by Prof. Louis Guttman, founder of the Institute of Applied Social Research in Jerusalem; they were applied in the context of a wide range of social problems. However, to the best of our knowledge, this is the first time that the nonmetric methods have been used in regional planning on such an extended and comprehensive scale.

The study consists of two consecutive stages: the first one employs the Smallest Space Analysis (SSA) method and aims to identify the mutual interrelations among the variables chosen to characterize the area on question. The second stage applies with the Multidimensional Scalogram Analysis (MSA) method in order to determine the (dis)similarity among the 228 zones which constitute the data base for the study and hence providing an insight into the governing factors characterizing the various zones. Such similarities can eventually enable us to group the large number of small zones into several larger planning regions, based on quantitative as well as qualitative characteristics, thus facilitating the work at later stages, especially with respect to transportation and location of central functions.

The paper starts stating the goals of the study. A short paragraph on methodology follows, enumerating the criteria for selecting the two above mentioned methods of analysis. This paragraph does not dwell on the theoretical basis of the methods which are described briefly in the Appendix. The findings and conclusions of the study are discussed in the succeeding chapter and finally an appraisal fo the study in the context of the overall urban system of the region is undertaken. The paper concludes with a bibliography divided into three parts: theoretical background, applications with regard to social studies and applications relating to urban and regional planning.

## GOALS AND OBJECTIVES

The three main goals of the study are as follows:

- a. Better understanding of the urban phenomena which take place in the metropolitan area; and their interaction with the planning process.
- b. Greater familiarity with the 228 sub-zones which constitute the basic planning units and the identification of the similarities between the characteristics of

each zone as well as between zones.

- c. Grouping of the small sub-zones into larger, and more meaningful planning zones.

The last point warrants further discussion. One of the major points, and most severe problems which confronts anyone engaged in large scale planning, either on urban or regional level, is the decision regarding the geographical domain of his work. Two diametrically opposed approaches are possible. The first one resorts to a detailed analysis, thus maintaining all components of data on a disaggregated basis. Detailed input data to distinguish between sub-zones is applied without any attempt to aggregate them into more meaningful planning units. This approach is generally empirically impractical due to the following considerations:

1. The multitude of statistical zones render the work cumbersome and unnecessarily expensive.
2. Such a procedure involves a large degree of redundancy, since many of the detailed decisions are made anyway at lower planning and legal echelons.
3. The general structure of the urban system tends to be blurred by the abundance of data.

On the other hand the second approach which calls for preliminary grouping of statistical zones into large regions based on conventional methods entails some objections due to the following problems:

1. The use of average values for a group of inherently dissimilar zones tends to conceal the heterogeneity of the group as a whole, and a significant portion of information may be blurred without being able to utilize it in the latter stages of planning.
2. Grouping of zones via this approach generally, employs a rather limited number of criteria. Any modifications in this list will inevitably result in a different grouping pattern. Therefore any approach which will achieve an aggregation of the zones, based on a considerable number of criteria and in turn without sacrificing important existing information on the detailed level, will be preferred. It is within this context that the non-metric methods presented henceforth have been applied in this study.

Following these three goals, four operational objectives have been formulated:

- a. The determination of interconnections among variables and how, if at all, the entire system may be divided into meaningful subsystems.
- b. Identification of independent variables in order to provide for treatment of specific problems.
- c. Determination of the dependencies among control and non-control variables. The non-control variables which are determined within the system and result from different combined effects of the control variables can be treated only via forecasts and a proper understanding of their functional relationship to the control variables. Their combined positive and negative side-effects will thus be predicted, subject to the adoption of the various desirable planning strategies. These in turn are established by means of manipulating the control variables.
- d. Gradual elimination of variables of marginal significance or which may be substituted by other variables.

The above goals and objectives were formulated accounting for possibility of application of quantitative models for allocation of functions in the metropolitan area (e.g. the Ecolatrix Model, Mazor and Krause, 1975).

However, the importance of attaining these goals and objectives is even greater when the more traditional procedures of planning are applied. In these procedures the systematic division into several meaningful subsystems is most essential.

#### METHODOLOGY

The two non-metric methods, SSA and MSA were selected in view of their special conceptual and operational advantages and following the favourable experience The Institute of Urban Studies (IUS) has acquired in their application.

The two methods have the following advantages:

1. These techniques enable the analysis of qualitative as well as quantitative data.
2. These techniques enable the analysis of phenomena which are non-continuous or which increase (or decrease) in a non-monotonous fashion.

The above two points often characterize urban phenomena which exhibit conceptual and empirical difficulties for the utilization of the conventional methods employing regression and correlation techniques.

In addition two empirical advantages are realized as well:

1. The output is graphically represented by a computerized map. This output can be readily understood and interpreted and does not require a sophisticated mathematical background.
2. The analysis requires relatively short computer running time, thus enabling a large number of alternate computer runs for a given budget.

Brief descriptions of the two methodologies are presented in the Appendix B to this paper.

#### PROCEDURE OF WORK

##### The Data

The study area of the six towns was divided into 228 statistical zones; 46 different pieces of information were collected per zone. The data consisted of four main groups:

1. Socio-economic characteristics of population within each zone.
2. Characteristics of zonal function activities such as employment, services, commerce, cultural activities, etc.
3. Trip attraction of the zones defined by trip-purpose.
4. Physical and qualitative characteristics of the zones, such as municipal designation, housing conditions, etc.

All data were converted from absolute values into relative ones, thus enabling meaningful comparison of the zones regardless of their size.

### Correlation Matrix

A matrix of correlations between the various characteristics is computed. All correlation coefficients are taken by their absolute value in order to establish the similarity relations, irrespective if it is a positive or negative correlation.

### Application of the SSA Algorithm

Once the set of data is prepared, the SSA algorithm has been applied. The output, a graphical representation of the relations between any two variables is exhibited in terms of distances. The closer the distances, the stronger the interrelations between them, accounting for all direct and indirect relations expressed in terms of their relations to all other variables. The grouping of various variables together, may be interpreted as similar behaviour, while the isolation of variables suggests that independent analysis is necessary.

### Establishment of Zonal Profiles - for the MSA

Each zone has been defined in terms of its profile, i.e., an ordered list of characteristics and their values, specified for each zone. Thus the profile will serve as an apparent identity of each zone. Completely or almost completely identical profiles suggest that these zones are identical with respect to these characteristics.

Each profile is determined by means of the following procedures:

1. Identification of the range of values for each variable and its mean value.
2. Partition of each range into few subgroups.
3. Assignment of any of the characteristic for each zone to the corresponding subgroup.

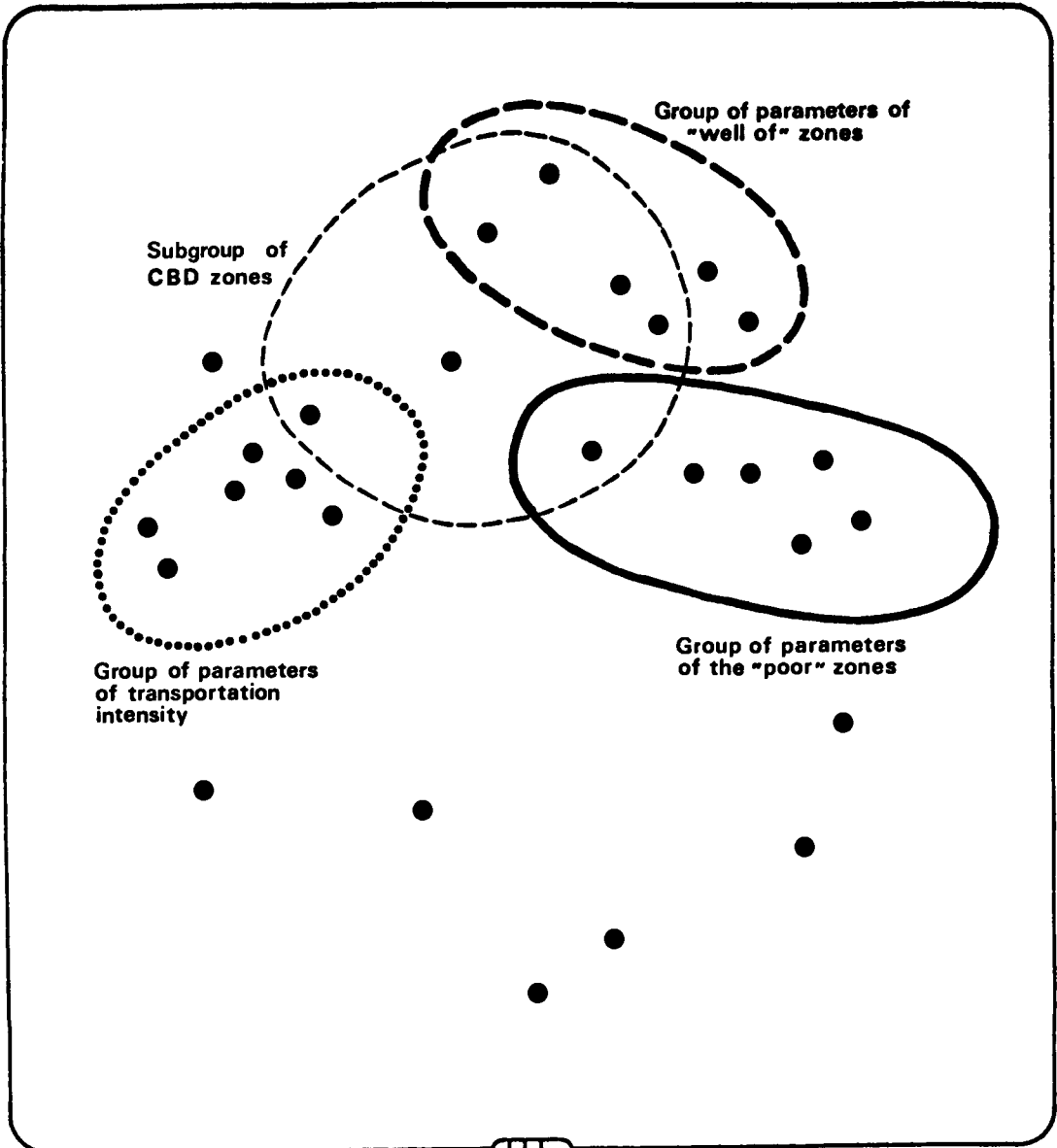
### Preparation for the Applications of MSA

Following the analysis of the results of SSA, the number of characteristic parameters has been reduced to conform with the limitations of the MSA algorithm - 28 variables only. These 28 variables were chosen out of the list of the original 46 variables. All variables which could be substituted or those whose contribution to our understanding of the urban phenomena was marginal, were deleted.

In addition, only four grouping categories have been found relevant for the re-definition of the profiles of the zones, instead of the previous six or seven, i.e., for each variable only four categories have been defined for the purposes of running the MSA. This reduced the options for grouping combinations of all zones and hence more detailed analysis of these combinations could be realized.

### Application of the MSA Algorithm

The application of MSA algorithm for all zones resulted in a graphical representa-



**Figure 1: SSA OUTPUT  
GROUPING OF VARIABLES**



tion of groups of zones. This representation exhibits the similarity between zones, in terms of distances as in the case of the SSA; the closer distance between two zones, the similar they are.

#### Establishment of the Most Frequent Profile

Following the identification of the major groups, a most frequent profile for each group has been found. This enabled a fast way of analysis and the understanding of the specific problems characterizing each group of zones and the reasons for their grouping by means of MSA.

#### Results and Findings

The major findings of the SSA and MSA are listed below. These findings were arrived at, after careful interpretation of several alternate computer runs. The enclosed computer maps illustrate the relative location of the various variables (SSA) and zones (MSA) when each point symbolizes a certain variable or zone. A list of coordinates included in the output enables the user to identify the variables and to locate them on the map.

The main findings resulting from the SSA, many of which were reconfirmed by the MSA, are the following:

1. The municipal designation of the zones was found to be completely meaningless. Stated otherwise none of the urban phenomena were confined to one specific town, rather many of them could be interpreted as part of a metropolitan pattern extending beyond municipal borders and are common to more than one of the towns included in the analysis. This finding was determined after two alternate runs; in the first one, each town was examined in contrast to each of the remaining ones; in the second run, Tel-Aviv, the largest city, was compared to all the other five towns jointly. In both cases, the outcome was identical. Thus, this finding obviously advocated the undertaking of comprehensive metropolitan planning for the entire region. The importance of this finding is even more important if considering the fact that using mean values would have resulted in all towns being similar at their mean.

2. No meaningful correlation exists between location of population and employment, i.e., the variable representing the ratio between the number of employees within a zone and the number of residents of this zone has been significantly isolated from all other variables, especially the socio-demographic ones.

This implies that there has not been found quantitatively any general valid interpretation for the generation of employment opportunities within a zone and all combinations of population-employment do exist within the region.

3. Qualitative interrelationship between employment opportunities and residential activities has been found most pronounced for location of industry and industrial workers, and nonexistent for the location of offices or services and residential location of their employees. Also no correlation was realized between location of universities and other institutions of higher learning and the place of residence of their students. Moreover, the last finding has been found to be even more general, i.e., the independence to a certain extent of the trips to learning institutions from the profile of trips of the zone as well as from its socio-demographic profile.

4. It was possible, following an analysis of the results to form a grouping of variables with strong correlations. These variables which are concentrated on the mapping plane of SSA may define characteristic zones. The pattern of behaviour of one variable within these groups of zones may be represented by other variables which are strongly correlated and thus provide means for interference on behalf of the planner. This phase of analysis is subsequently confirmed to a certain extent by the results of the MSA, and together they constitute complementary approaches to the objective of grouping subzones.

Based on this approach three distinct groups of zones have been identified.

Relatively poor zones. There is neither value judgement nor negative connotation to this definition; it merely describes an existing condition. Typical to these zones are: large families, head of family primarily of oriental origin, high density housing, low ratio of car ownership and high percentage of industrial workers. A certain correlation exists between the location of these zones and the location of the industrial zones which constitute the major source of employment for this type of population.

This correlation can be interpreted by means of two complementary explanations:

- a. Industrial workers choose to live in a closer proximity to their job than do workers in other occupational sectors due perhaps to their higher dependency on public transportation.
- b. The very existence of industry in the proximity of a residential area "chases away" those inhabitants who do not depend on industry for their livelihood as well as those high income earners who can afford the move. The remaining population inevitably becomes of low income level, being also the major source of industrial labor force.

Relatively well-off zones. These are, in fact, an exact "mirror image" of zones described in the previous paragraph: small families, mostly of European or American origin, high income level, high car ownership, high percentage employed in offices and to a lesser degree in commerce.

CBD zones. These zones, which to some extent bridge between the two previously mentioned zones, are characterized by relatively older people long term residents, high rate of participation in labour force, working mostly in offices and commerce but at a low income level. These same zones are also characterized by intensive trip attraction, especially for work in commerce. A certain geographical separation exists between the typical CBD zones specialized in commerce and between those specialized in services and entertainment. The zones of commercial character tend to be located next to, or even amidst, industrial zones.

The most characteristic factor of CBD zones is the intensity of trip attraction for all purposes.

5. The preceding grouping of zones, resulting from the SSA, suggested criteria for characterizing zones subject to significant correlations between their characteristic factors. It was possible to form also a grouping of zones based on their similarity and spatial location applying the MSA.

Four major categories or groups of zones could be distinguished within the Dan Metropolitan area as following:

The vacant zones. These are either vacant zones or those falling below the pre-determined population and/or employment threshold values (less than 200 inhabitants per zone and/or less than 4 workers/acre). They are planned to serve either as "green lungs" and recreation areas, or as the main land reserves of the region.

The pure active zones. These are very active zones from the employment point of view. They are totally, or mostly uninhabited, and have been located generally in accordance to land availability rather than to functional considerations, or formed following a long process of driving out residential activities.

The pure residential zones. These are primarily residential zones with very little employment activity, mostly on a neighbourhood level.

The "mixed" zones. In this category housing and employment activities coexist on a significant level.

The enclosed map illustrates the spatial distribution of the above four categories in the Dan Metropolitan Region.

6. The most apparent phenomenon related to the grouping of zones based on the preceding categories is the high heterogeneity of the metropolitan area. Group no. 4, which includes all forms of activities - business and services is the largest one and is comprised of 142 zones.

This may be explained due to historical process of spillover of services from the main center and the secondary ones towards initially residential oriented zones; due to planning criteria permitting the coexistence of housing and services. This is characteristic, to a certain extent, to the metropolitan core and its inner ring as has been identified in most metropolitan regions in the world.

7. Generally speaking, a strong asymmetry exists in the Dan region. The north and the northeast parts are characterized by a much higher level of variety and activity (of all types) as compared with the southern part. Also, a phenomenon of high urban intensiveness has been identified along a northeast axis of the metropolitan area, which provides an insight into the various CBD's of the four towns relatively to the Tel Aviv CBD.

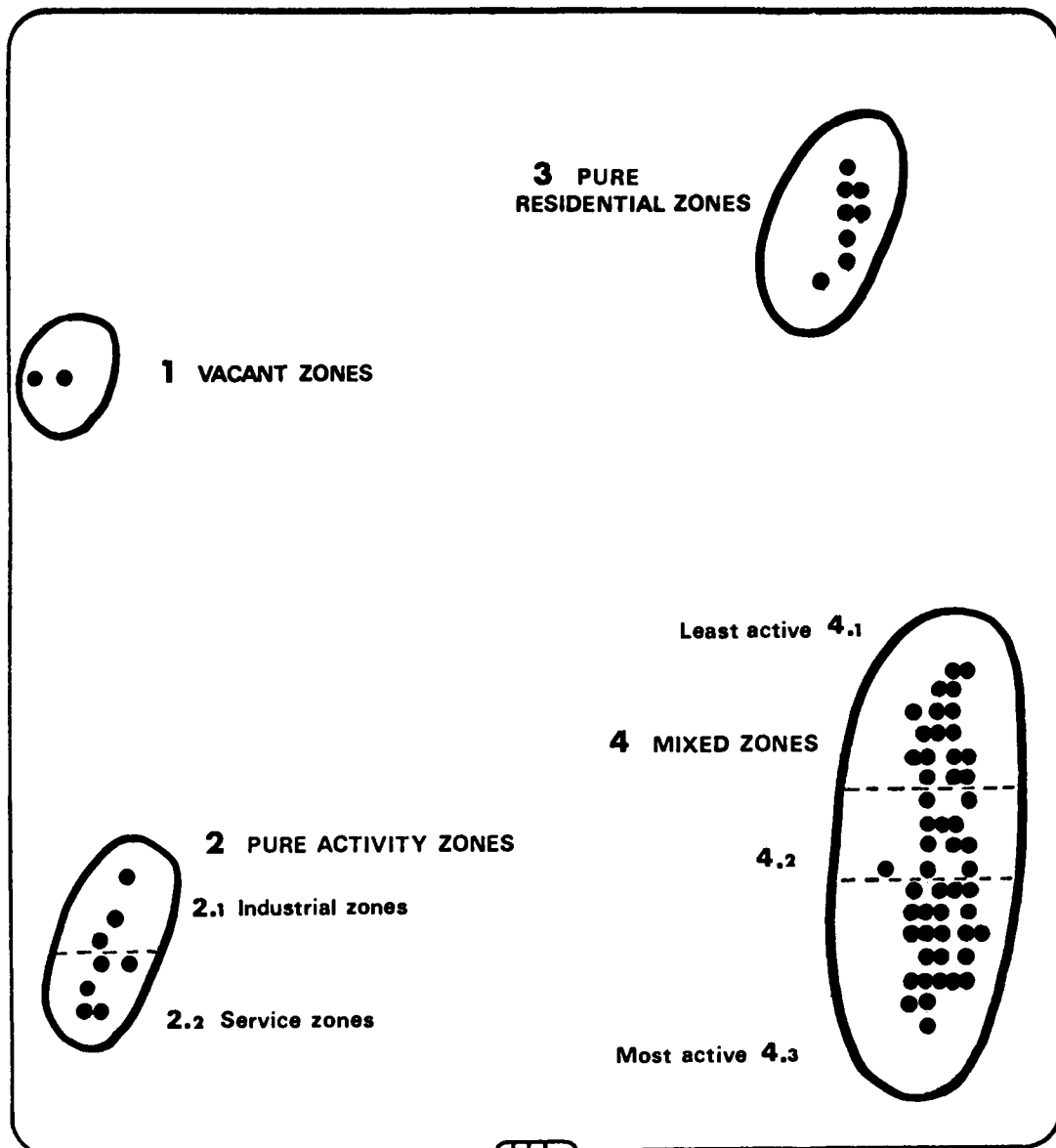
8. Several types of zones have been distinguished in terms of their type of activity, their density and income level. A detailed description of these zones is given in Appendix A. The results of the analysis with respect to the zonal characteristics may be summarized as follows:

Residential low density poor zones. The zones are characterized by the phenomenon of gradual transition from industrial employment to commercial employment and a gradual increase in car ownership which starts to take place even before change in the income level of the population is noticed. These zones constitute a natural potential for planned intervention related to physical and social rehabilitation.

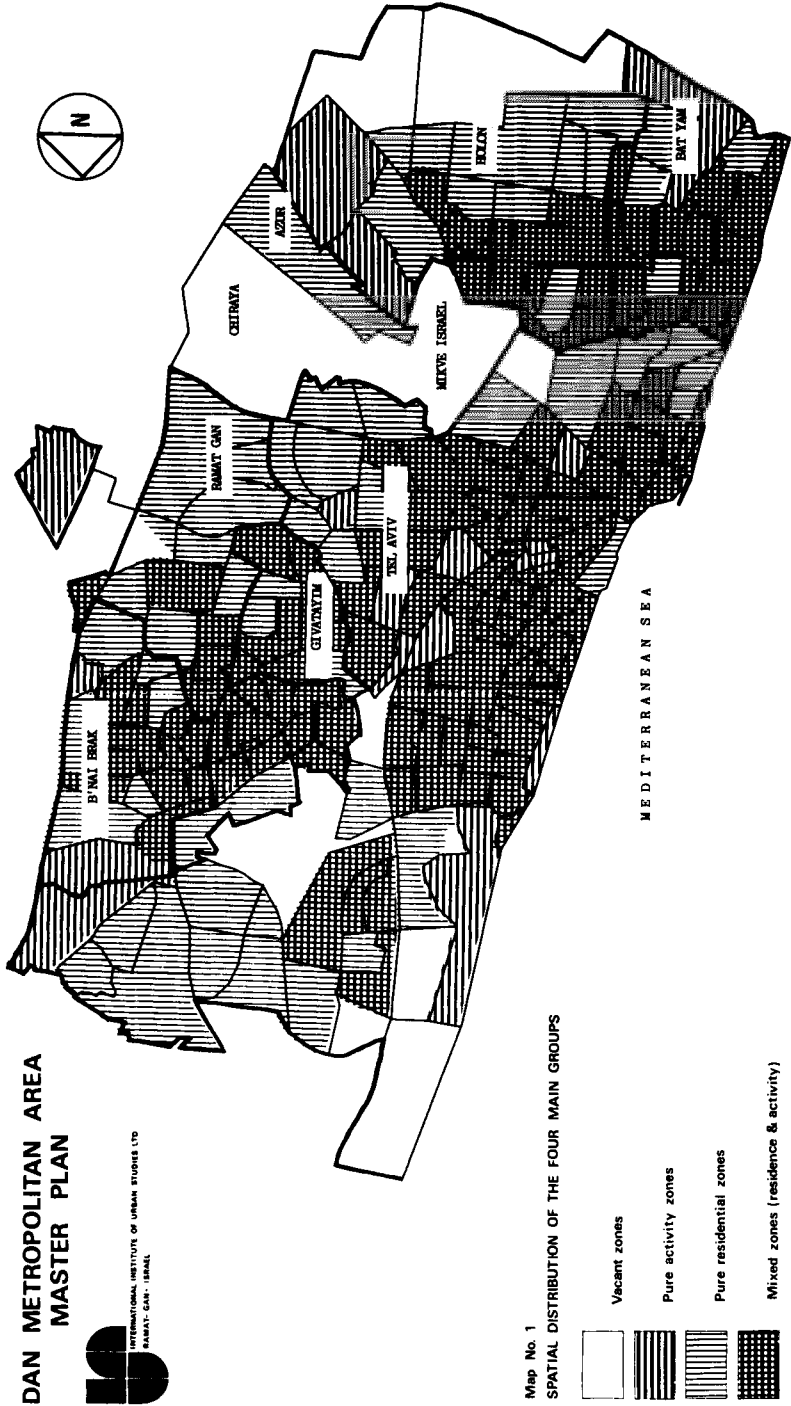
Residential low density, relatively well off zones. They exhibit a good self-image due to high environmental and housing quality, which may be expanded to include neighboring zones or utilizing them as a preferred zonal mixture for future planning.

Renovation is considered necessary in the residential high intensity, poor to medium zones, due to the small sizes of dwelling units and the homogeneity of the population. However, the high intensity of housing may pose difficulties if such a renovation is planned.

Zones which belong to the category of high density and medium to well off zones



**Figure 2: MSA OUTPUT  
DEVISION INTO GROUPS & SUBGROUPS**



are generally located in proximity to the "mixed" and centre zones of the metropolitan region. These zones preserved their residential character of high status succeeding to prevent the infiltration of employment and services activities into them. However, it should be realized that these zones may be in a transitional state and may transform into "mixed" zones where offices replace housing units.

The most important characteristic of the "mixed" zones is the combination of population and employment activities. However, a high degree of heterogeneity is observed within these zones, a phenomenon which coincides with the preceding findings of the SSA which established some relationship between population and employment.

The low level activity "mixed" zones serve generally as buffer zones separating between industrial and high quality residential zones.

It seems that both the levels of housing and the intensity of services and employment activities can be regulated and controlled to a large extent in this subgroup.

A low to medium transportation intensity is one of the important characteristics of the "mixed" zones with intermediate level of activity. Hence transportation activity is significantly lagging behind employment activities, which causes in turn a deterioration of their environmental quality. A slow process of aging of population follows and without comparative fast intervention the process of functional transition from residential to employment and services may not be slowed down or reversed.

Finally, the high activity "mixed" zones which constitute most of the area of Tel-Aviv are characterized by a comparative fast process of aging and decreased residential intensity. This process starts with the aging phenomenon and proceeds with a sharp drop in income. A substantial number of zones of this subgroup will eventually change their function to become pure activity zones losing the remainder of their residential activity. Other zones will require substantial environmental and social rehabilitation.

Only with massive and intensive corrective actions may this natural process be reversed and it will require large economic resources in order to overcome the high land values and high intensity of activities realized in these zones.

The rather significant findings of the two non-metric analyses, the SSA and MSA, as presented here, provide the planner with a set of results which enable him to form qualitative conclusions and to concentrate on the most important planning processes within the metropolitan region.

#### GENERAL CONCLUSIONS

The application of the Smallest Space Analysis (SSA) proved to be efficient, and yielded fast results. The analysis of the computer output enabled us to identify urban phenomena taking place in the region, and to derive important planning conclusions as follows:

1. The findings discussed in the preceding paragraphs relating to the significance of municipal designation and the relations between offices, services or higher learning institutions and residential activities indicate a relatively significant degree of freedom for the planner in determining the location of these functions within the spatial network of the metropolitan region.

The identification of this degree of freedom for planning purposes resulting from actual spatial distribution of these facilities, is hence of utmost importance for

purposes of normative intervention by an urban planner in an already existing and functioning metropolitan system.

2. The results presented in the paragraph discussing the "mixed" and centre zones of the metropolitan region, identify for the planner the decision variables for rehabilitation of the "relatively poor zones".

These variables, through which the planner may intervene and influence the population are:

- a. Appropriate housing, i.e., relatively large dwellings and improved environmental quality.
- b. Provision of accessible public transportation connections.
- c. Introduction of identified prestige urban functions nearby these zones.

3. As for the relatively "well off zones", it seems that it is impossible to influence the population via improved public transportation since they use private transportation quite extensively. However, it is necessary to preserve these zones from drastic changes due to establishment of functions which worsen the demographic composition of these zones.

4. The high intensity of trip attraction for all purposes which characterizes the CBD zones has direct impact on the planning of the road networks in the metropolitan area. It causes extreme variations in the environmental quality and population composition.

On the other hand the application of the Multidimensional Scalogram Analysis (MSA) enabled the planner to focus the planning effort on a limited number of problematic zones. It also generated insight and familiarity with urban processes taking place in the metropolitan area and which were outlined in a more general manner by the SSA. The major conclusion from this analysis may be summarized as follows:

5. The residential zones characterized by low density and low income constitute an option for intensive planning activity oriented towards physical and social rehabilitation.

6. It is possible to utilize the good image of the residential zones of low density and high level of population for their expansion and regulated spillover into other zones.

7. The "mixed" zones are characterized by a high degree of heterogeneity which provides an important range of possibilities to intermix various functions in a wide range of options.

8. The common factors characterizing the "mixed" zones of the core of the metropolitan region are numerous, a fact that complicates the task of internal subdivision, i.e., definition of the CBD zones. A more detailed analysis is currently underway to identify subgroups and relevant correlations within this heterogeneous group.

9. It seems possible that for some of the "mixed" zones of intermediate and high intensity of activity, it will be possible to intervene and reverse the process of deterioration or at least to control it.

10. Since there exists an obvious gap between employment intensity and transportation intensity, with the latter realizing a slower pace, the accessibility to the

highly active zones is relatively easier. This observation opens up planning options of major importance.

11. The findings of the MSA, combined with SSA results, enable the planners to further reduce the already abridged list of 28 variables into 11 significant parameters as follows:

- a. Population density (inh/acre).
- b. Percentage of small dwelling units (1-2 rooms).
- c. Percentage of elderly population (64 + yrs.).
- d. Percentage of high income earners.
- e. Density of zonal employment (workers/acre).
- f. Percentage of residents employed in industry.
- g. Percentage of residents employed in offices.
- h. Percentage of zonal workers employed in offices.
- j. Grand total of trip attraction for all work purposes.
- k. Total number of trips attracted for services and purchases.

This abridged list will thus assist to focus efforts in data collection on the most important items. It also facilitates the analysis of existing situations and the relevant functional dependencies for forecasting purposes in order to direct the planning efforts in the most useful ways. On the other hand it is possible to expand this list, depending on the purpose of the planning process, indicating the relevant variables for any of these objectives.

#### CONCLUDING REMARK

The non-metric techniques presented in this paper as applied to urban and metropolitan planning enabled the planner to group the statistical zones into significant small number of planning units, and thus to concentrate on the most important planning aspects. Hence, this phase actually constituted the preplanning phase providing the planner with an insight into the spatial and temporal interdependencies of the urban process.

It is with these aspects in mind that this study has been executed and proved to realize the planning expectations of these non-metric techniques.

#### APPENDIX A: CHARACTERISTICS OF ZONES RESULTING FROM MSA

##### The Vacant Zones

Considering the potential use of a given zone, this group can be divided into two distinct subgroups:

- a. Existing or future "green lungs" and major recreation areas of the region.
- b. Those zones constituting the main reserves of the region for housing, employment activities or a combination.

##### The Pure Activity Zones

The pure employment zones can be divided into two groups from a functional point



of view - industrial zones versus service zones. It may also be divided into two other groups according to the history of their formation - zones which acquired their present specialization as a gradual process as opposed to those whose function was determined in advance by the planning process, and their location was determined primarily by the availability of land rather than on the basis of a functional consideration.

### The Pure Residential Zones

The purely residential zones are in general in large continuous areas, although several of which constitute "islands" amidst "mixed" regions. The residential zones are characterized by a high degree of homogeneity, especially when compared with the other groups. They can meaningfully be sorted into four subgroups by using two criteria only, density of population and income level of the residents, as follows:

Low density poor zones. The population of these zones is mostly that described in the paragraph on "relatively poor zones". However, it is by no means an homogeneous population and the beginning of the two following socio-economic processes may be observed:

- 1) Gradual transition from employment in industry to employment in commerce and even in offices and services.
- 2) Gradual increase in car ownership.

It is important to note here again that although the above group of zones is characterized by low population density, here this term implies density of inhabitants per acre and not number of inhabitants per rooms. Most of the zones in question are indeed characterized by high percentage of small apartments and large number of people per room.

Low density relatively well off zones. The population of this category is mostly characterized by the attributes of the "well off" population, as described in the paper.

The low population density coincides here with low housing density since the zones are rich in large apartments. The zones are also characterized by a relatively high environmental level, by a good self image and mostly by high quality of housing facilities. These facts are primarily reflected in the average length of residence in the zones, which is significantly longer than that of the previous subgroup and indicates the residents' satisfaction.

In this group two exceptions exist. These are zones whose inhabitants manifest almost all the attributes of the so-called "poor population" but which, through transfer into commerce and services, acquired a high level of income and car ownership.

High density poor to medium zones. These are mostly the zones which were chosen, during the early 1950's for massive housing projects. They are populated by the same population as described in the paper. Again the rate of motorization for these zones increases at a much faster rate than the increase in income (a phenomenon which has important implications about the total volume of motor traffic of the metropolitan region).

High density medium to well off zones. The interesting point concerning the population of this group - all characterized by high income and high car ownership - is its heterogeneity. The border line between the two groups of "poor" and "well off" which was very clear for the previous groups is blurred for this group. However, two very significant phenomena exist here:

- 1) A clear transition of employment from industry into employment in services in first place and in commerce in second place.
- 2) Comfortable housing conditions (large apartments, small number of inhabitants per room), which compensates for the otherwise high density of inhabitants per acre.

The zones of this category are in general located in proximity to the central "mixed" zones. However, despite this fact they succeeded to preserve their character as residential zones of high status and to prevent the infiltration of employment and service activities.

#### The Mixed Zones

The mixed zones are differentiated along four major dimensions:

- a. Intensity of employment and services
- b. Transportation intensity (measured by trip attraction)
- c. Density of population
- d. Population characteristics.

However, in order to prevent an excessively detailed subdivision we found that a meaningful differentiation is possible along a single dimension - the level of activity existing in the zone in question.

Mixed zones of low level activity. The most typical characteristics of this group are: an extremely low level of motorization, low to very low level of travel attraction (even in those zones having high occupational activity), industry is the major source of residential employment, medium to very high percentage of small apartments and a large number of inhabitants per room. Employment is mainly concentrated in commerce and services.

The low activity subgroup is also the only one among the mixed areas subcategories to include a significant number (13 in total) of zones of low population densities. These zones, are characterized by a high percentage of industrial zonal employment; an especially significant phenomenon in comparison to the employment structure of the other zones of the same subgroup.

Mixed Zones of intermediate level of activity. This subgroup embraces three types of zones:

- a. zones encircling the main CBD.
- b. zones forming the main activity axis, stemming out of Tel Aviv and extending in the north-east direction.
- c. secondary CBD's of the peripheral towns.

This subgroup is characterized by three main phenomena:

1. The parameters describing the socioeconomic structure of the population coincide quite well with the metropolitan average values. This group is therefore a genuine intermediate group between the very low

and the very high activity mixed groups.

2. Since these zonal activities are almost exclusively local services, the transportation activity of the zones (for all purposes) is low to medium at most.

3. The housing density in this subgroup is relatively high, resulting from the construction of high density high risers in the areas of good accessibility. On the other hand there is a process of renovation where low density dwellings are replaced by services and commerce.

4. These zones show signs of downgrading of the socio-economic level of population and the deterioration of environmental quality.

The high activity "mixed" zones. These zones, which are the most active in the metropolitan area, occupy almost continuously the entire Tel Aviv area, with the center of Ramat Gan, one of the five towns of the inner ring which is located on the north-east axis being an outstanding case.

This subgroup is characterized by two main factors:

- a. Both transportation and employment activities are extremely intensive, this fact is reflected, unlike in the previous subgroup, by high ratio of zonal employment to zonal population.
- b. The population is relatively homogenous, and of the type described in the above paper, namely: high average age, small families, European origin, employed in services and commerce, low income and low car ownership levels. As a result of the small families, and the abundance of medium to large apartments, the housing density in the said zones is low or even very low.
- c. The zones are characterized by inferior environmental quality when this combines with the intensive motor traffic it distracts the population which can afford the move.

#### APPENDIX B: THE NON METRIC METHODS - MSA, AND SSA - CONCEPTS AND METHODOLOGIES

##### B-I Multidimensional Scalogram Analysis - MSA

Often, very complex systems can be comprehended only by focusing on the most qualitative features, hence even when dealing with purely cardinal data it is sometimes advantageous to connect it to ordinal categories. These categories are then analyzed through the MSA and metric consequences can be derived with no special assumptions.

Let us imagine "N" observations, each of which has a distinguished "profile" composed of "n" different characteristics (or variables). Each of the characteristics can be classified into " $m_1$ " mutually exclusive categories or levels. Some of the variables can be readily quantifiable, others only with great difficulties or not at all.

Various ways of presentation of these data are possible. Scalogram representation, and listing of profiles are the obvious ones but are impractical for purposes of analysis and pattern recognition. A graphical way where each item is represented

in an Euclidean plane (or in a space of 3,4, or 5 dimensions - the latter figure being the present upper limit of the computer algorithm) is another acceptable way. The points will be located in such a plane (space) in such a way that for each characteristic the points having the same category be located in a contiguous region of the plan. Another requirement is that the distances among the points of the same category be smaller than the distance between these points and points belonging to another category.

It is clear that as the number of variables and their subdivision into categories increases, so does the probability that some points will not be located, for a given variable, within the region of their respective categories. On the other hand, the larger the number of variables and categories the less freedom at our disposal for locating a given point; as a result, the location of the point relative to the other ones becomes less arbitrary and more meaningful. Its distance from our points can thus be interpreted as an index of similarity, when short distances mean high similarity and vice versa.

A "coefficient of contiguity" which can be conceptualized as the goodness of fit with which the data was reproduced by us in the 2, 3, 4, or 5 dimension space, has been defined for the MSA and our objective in locating the points is to maximize this coefficient. In practice, we work with a coefficient of contiguity ranging from .95 and above for a two dimension space.

It is important to note that physical distances between two points in the mapping figure are meaningless, and it is only their relative relationship which is of importance.

Locating the points (i.e. observations) in an Euclidean space of "j" dimensions is done by a method of successive iterations applying partial differentiation of the equations which express the coefficient of contiguity as a function of the coordinates of the points. The first approximation of coordinates is achieved through a special algorithm based on the analysis of the means and variances of the distances of the points.

#### B-II Smallest Space Analysis - SSA

In many cases we are interested in verifying whether a given phenomenon behaves according to a systematic pattern, or in other words, to establish the typology of the phenomenon.

One important aspect of systematic behaviour is presented by the smallest number of dimensions necessary to describe the distribution of its variables. Whenever the behaviour is completely random, the number of dimensions will equal the number of variables. On the other hand, when strong systematic behaviour exists, then we shall be able to describe the phenomenon, satisfactorily, through a smaller number of dimensions.

For many empirical problems it is recommended to concentrate on those observations which are valid on the one hand and with a minimum of irregularities on the other.

Hence, the problem of smallest realized space is of utmost importance in planning. The choice is between a very detailed description of the phenomenon, but most probably so blurred by irregularities that it will be impossible to detect any systematic behaviour (even if it existed), and between a somewhat more general picture which is easier to analyze. Choice of the second alternative makes use of the SSA method.

The method uses as input not the raw data but rather a matrix of coefficients of correlation within each pair of variables, using standard statistical techniques.

In general it is possible to argue that the closer to unity a positive coefficient of correlation between two variables is, the more similar they are. Therefore, a mathematical program has been formulated that locates variables as points in a Euclidean space in such a way that the physical distance between any two pairs of variables will be kept smaller whenever the coefficient of correlations between these pairs is larger. The degree of success with which the aim was achieved can be detected from a scattergram of the coefficients on the distances which is a standard part of the SSA printout. From the character of these relations it is evident that the aim of this methodology is to preserve the order rather than the metric distances between the points. Thus just as the MSA applying a non metric approach, this technique achieves a high level of goodness of fit while using a small number of dimensions.

The SSA method is thus a non metric methodology which:

- a. Preserves the order of data rather than its quantitative relations. Thus achieving a high degree of reproduction with a very small number of dimensions.
- b. Enables the analysis of qualitative data.
- c. Uses a computerized program.
- d. Resorts to visual graphic representation.
- e. Explains a phenomenon also through the analysis of the directions of the variables in space (not only dimensions).

These features are common to both nonmetric methods discussed here (MSA and SSA). However, SSA differs from MSA since it describes the typology of the individual observations. Hence SSA provides an efficient tool to analyze and understand specific phenomena realized in space.

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# Onwards from Urban Design

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## SCOPE OF PAPER

This paper explores the relationship between analytical planning and architectural or physical planning. It starts from the meeting ground between the two, often conceived of as urban design.<sup>1</sup>

Urban design has a long established place in urban planning, indeed having been an early feature of town planning under such names as civic design. But despite its longevity, there is by no means agreement as to what it means in concept and practice: conceptually some regard its scope as very narrow, ("the space between buildings" or the "three-dimensional design" of large developments); others interpret it as meaning the whole of urban planning; in practice some regard it as an extension of the architect's job and some as part of the planner's contribution. Thus its relationship to urban planning as a whole is not clear; and as practised currently it clearly is in need of advance.

This paper will review briefly past and current practice in urban design, describe the communication gap between analytical planners and architects and offer an interpretation of the reasons for it; finally it will propose a way of bridging this gap in order that urban design can take on an extended role.

## REVIEW OF PAST AND CURRENT PRACTICE IN URBAN DESIGN<sup>2</sup>

The issue of co-operation between analytical planners and physical designers was formerly non-existent, when the tasks were unified within one person who incorporated the skills of architecture with an understanding of the political, social and economic scene and with the knowledge of defence and other considerations. But by the beginning of the century, planning in Britain began to crystallise as a separate specialisation, somewhat removed from the architect and builder's three-dimensional concept of the environment. The physical design aspect of towns, whether for the creation of public spaces or for the provision of public services, had therefore to be consciously considered and thus a new area of work grew up under the name "civic design." Later on the phrase "urban design" was coined, and a conflict emerged between the planning and the architectural professions about whose domain urban design belonged to. The concept was also taken up gradually in the United States, following the import of the garden suburb movement.

Both Britain and the USA were influenced by the Beaux Art approach drawing on seventeenth century tradition mostly concerned with impressive, formal, compositions of urban space.

Later on the visual focus shifted from French formalism to picturesque old cities, and to modern "townscape" and "street furniture". But it was nonetheless a visual means of appreciating the environment.

In the sixties interest in the perception of the physical environment led to psychology, and to interest in the man behind the eye, the man that has also flesh and bones and economic and social needs. Coupled with the political atmosphere in the western world, which has been growingly attuned to the interests and expressions of people and communities, urban design now tends to take a broader look and could reconsider its areas of interest.

#### THE PROBLEM - A COMMUNICATION GAP

These days an ideal development process within the urban scene is often conceived of as taking place in the following phases:

- Planning analysis
- Land use plans
- Urban and architectural design
- Construction
- Disposal of property (in which houses, etc. are rented, sold or leased)
- Running and maintenance (in which the completed development is being utilised and is a slow process often leading to a change of views).

This appears a tidy and conveniently functional division of responsibilities. It suggests a neatly wrapped up parcel, which is being passed on from hand to hand to reach its final destination. It suggests that we are all focusing on the same end, and that therefore all those concerned share a common goal, common language and common methods of achieving it.

But in reality it is not quite so. A great amount of human energy and resources is wasted because the people entrusted with the job pull in different directions, either because they do not agree amongst themselves about the aims, or just because they are not aware that their activities lead in different ways. The reason for their lack of awareness could be that aims and consequences have not been made explicit, or that information does not flow through between the people involved.

These discrepancies are a constant source of friction between planners, architects, politicians, builders, maintenance people, others who dispense services to the community and the community itself. All those involved realise there are potential areas of contact and co-operation which if used could yield benefits and feel frustrated that the benefits are not achieved.

One such area of frustration lies between analytical planners and architects or architect-trained planners. The various planners involved in these processes have different skills and backgrounds (e.g. in economics, sociology, transportation) and often do not communicate well amongst themselves, but for the purpose of this short paper which focuses on the interface with architects, I will refer to "analytical planners" as a group.

Frustration between planners and architects commonly manifests itself in two kinds of work:

- the preparation of a town plan or master plan
- the preparation of a large scale development (residential, commercial or other).

An advanced preparation of a master plan is supposed to be founded on analytical planning studies. It may start with the production of hefty reports on the economical, social, political and other aspects of the town, rich with studies and data. The architect-planner who designs the outline scheme often despairs of reading the



reports of if he does read them often fails to see the relevance to his own work.

The design of a development project normally starts with a general instruction from the client to the architect, who then prepares his own detailed brief. The architect then proceeds with design, taking account of all the issues he can think of. But as his work progresses he meets interference from the client, the client's real estate advisers, etc. from the local authority planners bringing in new considerations affecting the brief and calling for endless changes that could have been spared had these views been considered in advance.

Thus there are several areas of contacts ending with frustration. The architect and the planners share the same view of one another: "You can't talk to them, the architect feels that the client and his advisers are "hopeless" and they in turn may feel he is useless".

This is not always the case but it is sufficiently common to merit investigation.

#### UNDERSTANDING THE GAP

Clearly there is a gap in communication at both master plan and project level. It becomes important to understand how things go wrong, what are the actual differences in approach of both parties, and how they might be put right.

Why is there a communication gap between architects and planners? Several reasons are suggested, to do with their ethos of planning, their concept of the product, and their methods of work.

What are these differences?

#### A Different Ethos

The planning ethos is an issue of controversy even amongst analytical or socio-economic planners themselves: should it be based on projecting current trends and values and providing for them, or should it interfere with the processes and structures with the aim of shaping the future? There happens to be a strong correlation between the architect or architecturally-trained planner and the latter view, whereas many more analytical planners will support the former.

#### A Different View of the Product

As for the product, architects or architect-trained planners very often have a vision of a finished product. It is a physical entity in a finished usable form, like a house. When extended to the design of a town the product is seen as the land use scheme in its final shape, at the target year. The designer thinks of peoples' reactions to the shape of the town, the visual pleasures awaiting them, the distances that they would have to walk or travel. Things that matter to people are conceived in physical elements such as distance, density, size of areas, availability of community services, etc.

The planner does not, or should not, think of that town in the target year only. To him the life of people in the year 1981, 1989 or 2000 is equally important. Thus it is not so much the end product but a developing and changing product which is his concern. Within that he considers the physical world not as an end in itself, but only as a receptacle for activities which people carry out and which are the real measure of achievement: do the people have to spend a lot of time travel-

ling to work, and does it cost them a lot or little? Does the housing scheme allow low-income families to occupy it at a feasible cost, and is the designed shopping centre economically viable? The sociologist-planner may be interested in people's sense of community, relationship to the authorities, tendency to violence.

### A Similar Framework of Approach

Methods of work and approach are also thought to be quite different for architects and planners. Yet a close look will reveal that the framework of approach is not all that different.

The planner's first stage of work is concerned with problem finding, goal setting, background studies, identification of constraints.

The architect's equivalent is the meeting with the client, at which he hears what his client wishes to build on the site, what are his current problems and future needs. The architect will then go to the site and study its conditions, the planning authorities views, recall his own experiences in similar projects, and write up a detailed brief for the project.

The planner's next step is generating, through data analysis, alternatives for the future, rejecting some and favouring others. He will probably bring more than one alternative to his client to choose from.

The architect's parallel stage is that of exploring, through sketches, various design possibilities. He tries different forms with a rough pencil, rejecting or modifying as he goes along. He normally settles for one, best design, to show to the client.

### Different Emphasis and Techniques of Work

But while similar in framework, there are very significant differences in the ways in which these planning and design processes are carried out.

The initial stage of background studies is given a major role in the process by the planners, who use rigorous socio-economic and statistical techniques for analysis. Emphasis is put on identifying the different goals of different sectors of the community, and on the attitudes of people other than of the planners themselves.

The architect, too, at this stage applies his mind to the future consequence of the development. Indeed he is interested in people, not just in the physical fabric. But the way he goes about it is not through rigorous analysis but rather an intuitive or personalised mode of analysis. This stage is to him only preparatory for the most important, creative, phase of work.

The creative phase is the architect's great strength. He can always think up alternative future forms which are different to those that are there today or that have been known before. He delights in thinking up more of them and trying them out on paper. His measure of achievement is not in the correct drawing up and analysis of existing buildings, but in the innovation of building forms (which sometimes becomes an end in itself). The recognition and evaluation of alternatives is done by the architect as he goes along almost unconsciously. His feeling or experience tells him that certain forms of layout would be better, almost before they are drawn up on paper. But because it is intuitive, it also runs the risk of omitting important factors or of over-emphasising less important factors.

With the planner the emphasis is reversed, the generation of alternatives is far less developed. He proposes a future situation by projecting past and present trends, sometimes allowing for alternative projection rates. Occasionally he explores and analyses future changes which he derives from proposals of others given in alternative plans (e.g. national, economic or demographic plans). It is more rare to find the analytical planner saying "we would like the future to look different to the present; people will have different distribution of incomes and different social patterns. Let's find a way of bringing it about". Once the planner has worked out alternative plans he evaluates them in a much more explicit and rigorous way than does the architect. He exposes a wide range of implications for different sectors of the community with regard to the different values and needs of the different sectors. The planner usually does not himself make the selection between alternative plans, but leaves the decisions to the policy makers.

Discussions and often arguments with clients take place in the process. The architect uses examples from his past experience, and a sense of conviction about what is useful, beautiful or "right" to persuade the client, while the planner calls to his aid statistics from a variety of comparable situations.

Finally one point of similarity between architects and planners is that both show a certain degree of separation from the management side of the project, whether house or town. Neither architect nor planner usually worries about the mechanisms of management and running of a development, which is viewed as the task of someone else down the line. It is as if they both hand over a carefully thought out machine and hope that the users will take good care of it.

Thus, while the framework of their approach is similar, planners and architects use different techniques in their work and place emphasis on different factors.

Why have these differences evolved? To what extent are they a result of the different material handled by planners and architects? To what extent are the differences perpetuated by the educational system which is subjected to compartmentalisation into disciplines by tradition, promotion paths, governmental agencies, allocation of government research grants, etc.? To answer these questions would require a separate paper. This paper however, accepts planners and architects as a given product of their schools, and seeks ways to bridge the gaps in actual planning work.

#### THE PROPOSED NEW APPROACH

Contemporary thinking has overcome many of the issues described in theory. It is widely recognised that towns are living organisms, that every day in the life of a town's population is as important as any other day, that change takes place all the time; that the distant future cannot be designed with ultimate precision. It is also recognised that the physical form is neither an end in itself nor just a receptacle, but that it has a vital role to play in directing activities, in making certain activities economically viable and socially possible. But the issues are still felt in practice.

While some individual architects and planners seem able to bring together many aspects of town planning to produce plans which are imaginatively creative and well founded in analytical studies, there is no common practice which allows all architects and planners to work in this way. In order that the communication gap between the professionals can be bridged a common approach and common language is needed.

The approach described below is one way of bridging the gap. The approach is based on the work of a team of analytical planners (economic, transport, development control and financial analysts) and architect planners who have collaborated within

one firm\* on several projects.

The description which follows draws on our experience with a few large scale development projects. The same approach has also been applied to problems at a "master plan" level. While the principles remain the same and much in the techniques of communication is similar, some differences naturally arise because of the different type of plan and the different analytical planners involved. The scope of this paper however does not permit description of the master plan work in any detail.

The set of principles on which we work are:

- Recognition of the importance of inter-relations between planning - design - implementation - utilisation and change.
- Recognition of the need for communication between the people involved with these phases, focusing on analytical planners and physical planners.
- Attempts to make explicit the analytical components of architect's work, and to enrich the creative possibilities of planner's work, through a process of communication.
- Plans are seen not as self contained entities but as a set of instructions for people to follow and change.

To ensure that the dialogue works between the architects and planners in our work, we find that it is essential for the architect to make explicit his way of thinking, so that planners can follow it and contribute to the exploration and analysis of alternatives stemming from physical design.

We shall now briefly examine some of the physical design alternatives that can be arrived at through conscious design, and explicitly evaluated. The physical elements, (which can be manipulated and which appear on a map or drawing) we call "design variables". These include:

- The shape of the site.
- Location and ground form of land uses.
- Area of land uses.
- Relationship between land uses.
- Points of access and circulation lines.
- Massing of buildings.
- Building layouts.
- Building surfaces and details.

For each of these variables several alternatives are likely to exist. The challenge to the designer is to be explicit in his own mind about the reasons for eliminating certain of the alternatives and settling for others. Some reasons may be fixed such as absolute constraints of topography, a railway line or the seafront. Others, on careful thought, may raise the need for further investigation. For example, the assumption that adjacent land uses are permanent while in reality the occupant may be planning to move, the assumption that people need pedestrian routes free of traffic, while a study may reveal that the potential users would rarely walk, because of the car ownership pattern, local climate, or social habits.

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Through the process of explicit consideration of the variables, the physical designer can identify the matters about which further information is required, on physical, social, economic or environmental matters. The architect or the physical planner is then in a position to call on the analytical input to provide information about the unknowns.

The analytical planner, for his part, is providing the considerations which should affect a design. Thus when writing up his findings, he ought to ask himself what, in the process of development, could be affected by these findings and what courses could be adopted. There may be matters of management such as the policy for subsidies, or the mechanisms of maintenance. And there may be matters of physical design options, such as described under the design variables. The better the planner understands what these options are, what issues they raise, and what information they require, the more useful his report will be for the developer and the physical planner. The analytical planner's scope of options is likely to be broadened by acknowledging physical combinations which he had not been able to visualise before.

This seems an ideal picture of an integrated process of analysis and design. Can it be brought about in reality? Our experience shows that it is possible, provided a well thought out, though not overstructured, process of team work takes place.

### THE DESIGN AND PLANNING TEAM <sup>3</sup>

The development planning team consists of planners with a knowledge of regional and local planning, economic demand, social aspects and transportation. The team also includes a physical designer, a financial analyst, and an expert on administration and management of a project once completed.

The first task of the team is to form a common view of the following items:

- The general aims of the project and the criteria by which we would judge a good development. Depending on the actual project, these can be limited to the narrow goals of profitability or balancing the budget of the public or private sector client, or can be extended to embrace the well being of all the different sectors of the community.
- The process by which we will meet the aims and yield the product. Here we work out the contributions that will be necessary in the process - clients, local authorities and professionals - and the inter-relationships between their contributions: at what stage and in what way they interact.
- The product of the work. In the case of development projects, the product is usually a development brief rather than a planning report or detailed architectural design. The concept of "development brief" will be discussed in more detail below.
- Finally the programme of work is agreed and drawn up in the form of a diagram showing the various inputs and time tables.

Discussing and agreeing the matters above is the first step towards understanding one another and setting out common objectives.

I will now describe in more detail the two most important parts of this work, the product and the planning process.

### The Planning Process

The process of our work oscillates between analysis of information and synthesis of the information into design. The architect extends his activities into the analytical process and the planner contributes into the design or synthetic phase. A simplified diagram of the process is shown as Fig. 1.

A coarse breakdown of the process gives these major headings:

- Reconnaissance studies
- Alternative designs
- Analytical evaluation of alternative designs
- Further studies to assist design and evaluation
- Selection of preferred alternative
- Preparation of development briefs.

What is behind those titles?

Reconnaissance studies. These are brief reviews or background studies of problems, opportunities and constraints to identify the main issues. Detailed studies are conducted later when the kind of information that is critical becomes clear.

Reconnaissance starts initially on specific lines of investigation, e.g.:

- Formal planning context (the planning authorities and the public interest)
- Social and economic demand (what uses are viable, when and how much)
- The owner's/developer's context (their aims, capabilities, financial constraints, etc.)
- Management aspects (from social to technical issues)
- Physical potential (capacity range of the site, linkages to the outside world, topography, climate, etc.).

Each line of investigation culminates in statements of the desired outcomes of the development, quantitative ranges of the matters it investigated, and difficulties anticipated. Thus it will not be a set of briefs for physical design, but rather an exploration of the considerations that should go into it. The statement of physical potential, includes analysis of the design variables (area, location, shade, height, linkages) and the factors which might affect them.

The resulting statements are passed around amongst the team, then discussed jointly and amended.

Preliminary alternative land use bundles and designs. Preliminary alternatives are formulated, taking into account the statements produced by all the streams of investigation, and taking pains to show the range of possibilities and the factors affecting them. The alternatives are expressed as a set of sketches and written documents, showing the potential three-dimensional options.

Preliminary evaluation. Evaluation of the preliminary alternatives is carried out by the people responsible for the various lines of investigation who each assess how the proposed bundle of uses and their design respond to his particular criteria, e.g. social, financial, traffic, etc.

This is a critical stage in the process - the planners become aware of potential new physical forms which in turn suggest possibilities for them to consider. The architect becomes conscious of the implications of the differences between his alternatives, and may find the need to redesign because of additional factors such as

financial phasing, public reaction, etc.

A few examples from one experience illustrate the value of the mutual critique at the evaluation stage:

- The architect's favourite, physically attractive, option was financially non-feasible, but another option only slightly less attractive was quite viable.
- A physical link at an upper level made possible a use of the site which the economists never even considered when first proposing their land use brief.
- The phasing scheme proposed by the architect was unreasonable from the viewpoint of economic demand and cashflow, but once these considerations were brought up, the architect was able to devise a suitable phasing scheme.

Had the planning studies been separate from the physical design and culminated in a finite quantitative brief of land uses, or in a theoretical demand forecast, the above findings would never have been revealed.

Further studies. The need for further studies is usually indicated by the preliminary evaluation in order that a firmer view on the feasibility, comparative merits and precise quantities of alternative schemes is established. Thus a second round of planning studies and analyses is conducted, focusing on the critical issues.

Modified alternative schemes. After gathering better information on critical issues it is now possible to modify the alternatives and come up with refined designs.

Revised evaluation. Revised evaluation of the new designs is carried out on the basis of further information. After re-evaluation the main decisions on the development are made and are ready to be presented to the people charged with carrying it further: architects, builders, social workers, real estate and maintenance people.

#### The Product: The Development Brief

When dealing with large scale development projects the team aims to produce not merely a plan but rather a "development brief".

The development brief is made up of instructions which will allow the development to be carried to completion. It is addressed not simply to the architects, but to all who are concerned with the development, i.e. the clients and their professional advisers (architects, engineers, valuation surveyors, financiers, lawyers, administrators, etc.). All will participate in the development process in a manner which will be influenced by the development brief itself.

The way in which we prepare the plan means that it is different from most plans. It spells out why specific suggestions are made, and thus makes it possible to introduce changes if circumstances change.

It addresses itself to the tasks and to the means of expression of the people who have to use it, be it as physical design variables and how they should be judged, or financial balance sheets and the form of information that has to go into them.

The output of the brief is usually composed of three sections:

- The brief to the architect
- The brief to the developer, envisaging all the operations that have to be undertaken from conception through design, construction, dispensing and running of the development.
- The financial brief spelling out all the assumptions on costs, revenues, rates of interest, and the time at which they will be undertaken.

The brief to the architect. The brief, written by the urban designer on the planning team, addresses itself to the physical design variables and emphasises the most important considerations which should affect their design, such as financial feasibility, social, climate, etc. The brief normally consists of two elements:

- A written analysis
- Design illustrations

The aim of this brief is to provide the architect with a good understanding of the context for his design, and of the considerations that he should bring to bear on his detailed work.

One outcome of the earlier stages of work is a quantitative schedule of land uses. This is presented in the architectural brief together with the reasons for deciding on particular mixes and quantities of uses. In this way changes in information, circumstances, policies or interpretation of facts which would lead to a revised schedule can be considered while the design is in progress. It also enables the designer to assess the importance of marginal changes in the proposed quantities, thereby avoiding the common situation of the architect going to great lengths to satisfy a figure which was derived arbitrarily, or the architect taking liberties on elements which have tremendous importance.

The illustrations which are handed over to the architect as part of the architectural brief should not be regarded as a dictated design. Rather they are explorations of what can physically be achieved on the site, to provide a basis for assessing implications of traffic, planning, costs and revenue. The illustrations are the best solution that the planning team conceives and the basis on which evaluation of the merits of the projects were carried out. The architect then has the task of producing a design of equal merit, or preferably of improved quality. If an improved scheme cannot be devised then the architect may wish to fall back on the illustrations in his brief as the basis of his detailed architectural scheme.

There are situations where a definite urban design scheme comes up in the development brief. This arises for example when there is the need to co-ordinate the designs of several architects on the same site, with joint infrastructural character.

The brief to the developer. This brief consists of the highlights of the implementation process:

- Land acquisition
- Providing the supporting services
- Construction process
- Disposing of properties
- Maintenance and change

This brief provides an outline of the required inputs and their envisaged time table, to ensure co-ordination between all the efforts that bring about a successful development.



Being prepared by the planning team with its management expert, rather than by an independent management consultant, ensures that the assumptions behind the plan and its evaluation will be borne out in reality. These may relate to the land acquisition costs, the site preparation and construction, the relationships with tenants and assumptions about levels of maintenance on which the successful design of spaces depends.

A major component in this brief is the financial programme. Because of its importance, and as it is often being handled by a particular person or section, we have singled it out for a specific brief.

The financial brief. This brief spells out the financial assumptions behind the scheme, and provides an outline programme of cash flows and balances, so that the developer will know when and where to look for money, when and where to expect returns to the investment.

During the planning phases alternative schemes and possibilities were assessed. Major considerations in that assessment were financial feasibility, financial implications for the various agencies or sectors of the community involved with the scheme, and a concern with a developer's constraints and outcomes. The assessments were based on assumptions about the costs of site acquisition, preparation and development, costs of management, of acquiring planning consent, etc. Similarly revenue assessments were based on assumptions about market demand and market prices at different times, interest rates, discount rates, subsidies and taxes.

By spelling out the assumptions behind this programme, it is possible to keep track of changes to which the outcome is most sensitive. Such changes may stem from external market situations, Government fiscal policies, from internal changes proposed by the architect in the process of design, or from changes introduced by management later on.

Thus the client, whether public or private knows what to expect, how to adjust their activities because of external changes, and how to react to proposals about internal changes.

### CONCLUSION

The process we have described ascribes to urban design a different and more dynamic role in the planning process, compared to that of its traditional image of three-dimensional design of large spaces. We view urban design as injecting into planning the possibilities offered by physical variations, and uncovering for the architect the economic and social implications of his physical options, i.e. extending the architect's analysis into a methodical one.

The urban designer in the team can be the future project architect, or he can pass on the design considerations to the final project architect in a language which both of them share. In consequence, the project architect would be aware of the appropriate criteria, and will feel that the planning contribution was indeed relevant.

Planners who go through this exercise appreciate the excitement of creating different, alternative futures, and clients have a much clearer view about what is facing them, before embarking on detailed design and construction of a large project.

It is really a very basic and obvious approach, no more than a structured exercise in teamwork. It can be brief or long, so long as the general comprehensive approach is observed: in one case, we spent two years preparing the development brief,

because issues were complex and the outcome of detailed study could sway the development one way or another; in a second case we did the exercise in less than three months because detailed data were of less consequence. In every case, the parties involved felt the process was well worthwhile. What more can one ask for?

#### FOOTNOTES

1. It is an extension of an earlier paper on the topic by Nathaniel Lichfield and Dalia Kadury Lichfield towards urban design, Northern Architect, Great Britain, 1977.
2. This telescoped history is a personal statement derived from various sources.
3. The following is based on the synthesis from various commissions.

# The Urban Public Space Network as a Planning Concept

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We know quite well that an important prerequisite of man's adaptation to his environment is the knowledge he possesses of that environment. Knowledge is expressed by internal representation or images of physical items, activities, and meaningful contents (1). This "internal building" is equivalent to the Piagenian well-known term, "assimilation", a process which is often problematic when dealing with the modern urban environment, due to its exceptionally complex structure extending over extensive areas of land, its tendency toward standardization and repetition, and the fact that it is constantly changing.

Another reason for the difficulties in environmental assimilation is the lack of continuity and the brevity of the "staying and learning period" in different parts of the environment. This phenomenon stems from the great mobility of modern man, necessitated by his patterns of economic and social activities. The result is inefficient functioning and problems in movement and navigation. Under these conditions, not only is the individual unable to assimilate new inputs efficiently, but even existing memory structures become increasingly vague.

Kevin Lynch (2) was aware of these phenomena and challenged the modern urban system to create a legible and imageable environment through proper use of the physical planning tools available to the urban designer. Since that pioneering piece of work by Lynch, there has been a growing interest among planners and designers in the subject of environmental cognition. This interest has been followed by increased efforts to find the planning parameters necessary to achieve a higher quality and broader based level of environmental knowledge. Let us try and formulate the principles of knowledge construction.

Environmental visual inputs are composed of the visual characteristics of two types of items found in our physical environment: site items, which serve as "containers" for activities located in specific sites; and linkage items, which include channels of interaction between the various activities. The visual input variables describe, on the one hand, the visual appearance of those items, and on the other hand, the pattern of spatial relationships between items or groups of items (sites). These relationships express the type of form of spatial distribution of activity sites, physical contingency between neighboring sites, as well as the spatial configuration of the system, as defined by a linkage pattern and topological and Euclidean measures.

The processing of this input usually follows a course of sequential experiences in which most of the visual inputs, and especially the system of spatial relationships, are absorbed step-by-step in a specific order. This absorption is, of course, selective and influenced by the individual's attention processes, motivations and expectations, as shown by Carr & Schissler (3).

The procedures and mechanisms for the internal organization of sensory inputs have been widely studied by psychologists. According to symbolic models (such as Posner's and Neisser's [4, 5]), it is known that the long-term memory (L.T.M.) is responsible for organizing continuous inputs into a comprehensive structure which can be stored for long-term use. This complex system controls also the internal organization of the environment. Presumably, this organization operates in the following four ways:

1) Site organization is the organization of the visual inputs of particular site and linkage items, with a relatively limited dispersion, into a "picture" of a particular place. Here, images of buildings, groups of buildings, scenic views, parts of roads and intersections, are created and stored.

2) Macrostructural organization is responsible for the internal mapping of large scale environments which contain a collection of sites. This macrostructural organization defines three types of interrelationships between places:

- i Serial organization, which links places, by means of chains of association - according to the order in which they were experienced in reality. This serial organization is very powerful, as evidenced even by the ancient mnemonic techniques of Simonides, Cicero, and others as shown by Paivio (6).
- ii Spatial organization, which defines the spatial relationships in the environment by means of geometric measures. In this type of organization, linkage items are spatially connected and create a network which forms the structural skeleton of the environment. In organizing this network, the individual uses geometrical and structural concepts which he already has at hand, such as the right angle, triangle, circle, square, and the like. The dominant role played by routes of movement in spatial organization has already been reported by Appleyard (1), and one can assume that this dominance will remain as long as people continue to experience their macro-environment through movement in these routes.
- iii Anchoring. This type of organization combines the two previous types and produces a spatial system of places connected by routes. It "anchors" site items and places within the structural skeleton of the road network.

In addition to L.T.M., which is responsible for carrying out the above organizations and for storing them for long periods of time, there exists an active memory (4), which is a limited capacity system. The active memory is divided into two categories:

1) The Short-term memory, whose function is to organize the external information - after perceptual coding - and to store this information for a brief period of time before it is transferred to the long-term memory.

2) The operative memory, which is responsible for the activation of structures which have been organized and stored in the long-term memory. The purpose of this activation is to transform unused, stored information into conscious and readily available information for thinking operations. The retrieval of the visual images, or spatial maps, which have been created and represented internally by the L.T.M. is carried out by the operative memory, which thus serves as an "internal

screen" on which we can see the stored visual information "through the mind's eye".

Thus far have been discussed the mechanisms and internal structures which produce human environmental cognition, or - in other words - human knowledge of the environment. It will now seem appropriate to indicate a few principles concerning the relationships between environmental sensory information and environmental knowledge.

In the present context, knowledge is a structured transformation of the outside world. This transformation works according to principles of abstraction and symbolization. Piaget & Inhelder (7) note the existence of such processes, and deal with the internal display as a selective scheme, containing only a few of the outstanding features of the visual input. These principles of organization complement the well-known "chunking" principle indicated by Miller (8), which explains the organization of single items of information into units of a higher order. This principle of organization plays an important role in one's continuous day-to-day experiences. The chunking principle takes widely-varied bits of information and unites them into schematic units, additive and concise, and thus prevents "blockages" in the continuous processing of information.

The tendency of human beings to perceive information in a structured manner, to identify relationships instead of separate items, to remember wholes and not fragmented data, has been known since the early period of the Gestalt school.

We know that people seek structural information in their environment; they want to clearly understand the entire physical network and, of course, they tend to use this understanding in their overt day-to-day activities.

There is also evidence that structural understanding of one's environment is not only important for crystallizing one's instrumental orientation towards the world, but also plays a central role in building one's sentimental orientation.

We may assume that most people - unlike planners - do not construct internal land-use maps; their mental organization is less sophisticated and less analytical, and is based on direct sequential experience, which often takes place within the Public Space Network (P.S.N).

The P.S.N., which includes roads, pedestrian paths, open spaces and public facilities of different kinds, is the physical skeleton, the main functional content and the symbolic meaning of urban life.

The cognition of the P.S.N. is not just a mental accumulation of separate urban pictures, but rather a mental structuring of an environment.

In urban design this psychological concept of P.S.N. must be followed by a planning concept, or a policy, which expresses the need for designing the P.S.N. as a total system, composed of interrelated elements, such as modes of activity, linkages, and specialized areas covering the entire city.

Apart from the methodological consequences of such a statement, which are obvious, there are many important design problems to be raised, in respect of the physical form, the three-dimensional image and functional pattern of the P.S.N., problems which could only be raised within the broad framework of the P.S.N. concept.

Some important design issues deserving mention are:

- the sequential character of P.S.N.
- the topological and geometrical layout of P.S.N.

- the problem of order and regularity.
- the visual significance of the P.S.N. and the spatial relationships between modes of movement.

What is the state of art of modern urban design in respect of these issues? In Israel, as in many other countries the pattern of urban central places is fragmented and incrementally treated, and development programs deal mainly with the quantitative allocation of facilities.

There is too little care for spatial human experience, for true urban life! We must direct part of our efforts back to the historical orientation of urban design; to integrate old motivations with new scientific theory and modern methodologies. The fact that our knowledge of environmental perception, cognition and experience has been growing, and that more and more architects and planners find the field attractive and promising gives some hope for a renewal of urban design.

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# The Rurban Village

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When peace comes, young Israelis will not be lacking in problems that challenge them. One of them is the threat of Megalopization of the country: the concentration of population in a few heavily urbanized regions.

Jews outside of Israel live almost exclusively in towns and they engage in city type occupations. To counteract this urban preference, the Israeli Government has a long standing policy to encourage the settlement of as yet not well developed rural regions. It has worked only in the past. While Israel has a strong agricultural and rural economy, the urban Natanya-Tel Aviv, Tel Aviv-Holon and Jerusalem areas still are the magnet for much of the country's population.

Central planning to counteract this Megalopolization was very active in the 1950's, when Israel's population doubled and tripled. The Settlement Department then had the power to distribute newcomers in accordance to a plan to populate otherwise empty borders, in new development towns and in as yet under-developed areas. Among them, was the Ta'anach region, near the city of Jenin on the West Bank. Ten villages were planned and settled there. The area had been a swampy area which a century ago, the Rev. Canon Tristan described in Charles W. Wilson's classic book of 19th century Palestine in the following words:\*

"...when leaving Jenin we skirt the western edge of Gilboa till we reach the once royal Jezreel...But there is nothing to mark its by-gone importance...Not a tree or a shrub relieves the monotony of the valley of old Jezreel; we see only innumerable cisterns and marble sarcophagi strewn about, some of them still perfect...There is no trace of royal gardens nor a vestige of a vineyard on the hillside".

In 1956, after extensive land preparation to drain the swamps and to build small cement shells for future settlers, Baraq and Dvorah were settled by groups of immigrants from Morocco. They came directly from the boat, after it had landed from Morocco. All of them were former urbanites, mostly from Casablanca, and Marakesh. None had previously been farmers.

Two decades later, our study looked at how the original planning had worked out. Much creative thought had been given to site planning. The area was laid out in accordance with a cluster model advocated by Dvorah, Baraq and Adirim were part of

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\*The Rev. Canon Tristan, Doctor of Divinity, F.R.S. "Esdrealon and Nazareth" in Colonel Sir Charles W. Wilson, Picturesque Palestine: Sinai and Egypt, 1880. Republished under the title The Land of Galilee and the North, Including Samaria, Haefa and the Esdraelon Valley, Jerusalem, Ariel Publishing Co., 1975: 27.

a multi-neighborhood village, to be called Hever. A common area was set aside for stores, community facilities and to house non-agricultural families needed to provide local services, such as teachers and other local administrative officials. Each family was given roughly equivalent resources, including seven dunams of irrigated land near their homes plus 38 dunams for dry farming. Surfaced roads had been built before the settlers arrived to connect each cluster to a main highway.\*

The Settlement Department of the Jewish Agency had four major goals:

1. The absorption of immigrants through agricultural employment on the basis of which they could earn their own living and achieve an increasingly high standard of living.
2. Production of agricultural produce for the market, for domestic and export use.
3. Improvement of the country's security by settling and guarding what was then the border with the West Bank.
4. The development of community services to meet the population's human needs for health care, education of their children, welfare and cultural needs, that would make the communities a good place to live.

Twenty years later our findings left no doubt that these planning objectives had been accomplished. In these two case studies, it was possible to observe both the degree of success and the limitations of this long range regional planning effort. When plans are implemented, the outcome is always a mixture between the anticipated and the unanticipated.

#### PLANNING ERRORS ARE INEVITABLE: OUTCOME CAN STILL BE FUNCTIONAL

Planning involves the examination of data from the past and present, to make forecasts of the future - and then to modify these forecasts by manipulation to achieve social policy objectives. Acting on this concept of their task, a principal policy maker of the Jewish Agency Settlement Department confidentially counselled against settling the people in Baraq who had been chosen for this purpose before leaving Morocco. He wrote on May 21, 1956 as follows:

"Settling these people on the land as farmers is like putting a top hat on a Bedouin or a tuxedo on a Hottentot. I do not think that their settlement...would make a positive contribution to the development of the Ta'anach region."

This expert advice was ignored. Two decades later, Baraq is inhabited by ruralized families who are part of the country's relatively prosperous middle class. Their children finish high school; they serve in the army. Many attend universities. The neighboring old line and prestigious Moshav villages of Kfar Yeheske, Hayogev, Balfouria and Tel Adashim voted to consolidate their grade schools and now bus their children to Baraq.

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\*Emmanuel Yalen, The Design of Agricultural Settlements: Technological Aspects of Rural Community Development, Jerusalem, Israel, Rural Settlement Department, 1975.



The Settlement Department planners had been quite effective in the field of agricultural engineering and crop planning. The villages in our study report high yields. But from the start, planners were less on target in their human resource evaluation. They did not realize that the immigrant group from Morocco, who had largely selected each other for common Moshav settlement, had their own capable indigenous leadership. They did lack agricultural experience, but the officials of the Settlement Department knew little about the culture of the people they were to turn into modern farmers. These Schalichim or agents dealing with the future settlers of Baraq did not speak French or Arabic. They did not realize that many had been active in a Moroccan Zionist movement. All came from upwardly mobile families. They were ready, possibly as much as the better known pioneer settlers (Chalutzim) from Europe, to transform their life style. And twenty years later, the culture gap between the Moroccans and their European neighbors has been largely bridged. In the field of social and economic development, the settlers made drastic alterations in the original blueprints prepared for them by the Settlement Department officials.

COOPERATION MUST BE SUSTAINED BY PRAGMATIC CONSIDERATIONS. IT  
CANNOT SURVIVE SIMPLY ON AN IDEOLOGICAL BASIS

Baraq and Dvorah maintain many of the conventional cooperative agricultural activities that are part of the Moshav ideology. Large crops are farmed cooperatively. Much of the purchasing and selling is also done on a cooperative basis. But a cooperative Machine Station is now abandoned. Each village is setting up a separate central store. Overhead costs exceeded income. The settlers are more pragmatic than ideological when it comes to deciding on how much farming is to be done cooperatively.

RURBANIZATION REPLACES RURALIZATION

Less than ten percent of these families who were originally settled in Dvorah and Baraq in 1956 left their original farm for a city job. This stability exists in spite of the existence of alterations. Nearly half of our samples of 60 families reported to have considered moving at some time-- 20% to a city, 8% to another place in Israel and 20% to go abroad, to France and the U.S.A. These facts are in contrast with the constantly shifting population of Israel's early development towns and certain Moshavim, some of which were abandoned altogether by their first settlers. What kept our settlers on the farm? Each family experienced a somewhat individualized decision making process. But there was one social-economic trend, that may help to explain the social cohesion of this planned community.

Baraq and Dvorah are no longer simple villages. They are rurbanized communities. They have an agricultural economic base, but their income is supplemented with urban type occupations. 76 percent of the husbands have a part-time or full time job outside farming, in addition to their agricultural task. 20 percent of their wives have an "outside" - off the farm job. 77 percent of the families in Dvorah and 48 percent of those in Baraq reported in 1975 to own a private automobile or truck. Nearly all have improved their original cement shells into extensive villas. They can easily get to Haifa and Tel Aviv to shop and for recreation. They have a lifestyle which has much in common with that of the citified middle class, except that they are somewhat more prosperous. They are not peasants, but part of the country's mainstream, who happen to derive part of their income from agriculture.

The rurbanization of Baraq and Dvorah has not yet proceeded as extensively as in Israel's Kibbutzim: its collective farms. In 1976, the Kibbutz movement reported to be operating 291 factories, including metal working, printing, electrical goods and electronics, wood working, rubber and plastics, textile and leather, building

materials, food products, chemicals, decorative accessories, opticals and other non-farming enterprises. Their non-farming income exceeds their farming income.

Our two Moshavim, much like the Kibbutzim, are demonstrating that many aspects of an urban lifestyle can be maintained without moving into Megalopolis. Indeed, the quality of life, if measured by the near absence of pollution, slum related crime and other negative aspects of city living, has much that gives it competitive advantage. Megalopolization can be further counteracted by careful social planning to strengthen the attractiveness of rural-urban type living away from the country's crowded cities.

Throughout the developing world, rural masses are streaming into big Megalopolis centers. Cairo, Amman, Tokyo, Bombay, and Addis Abbaba all have become unmanageable slum cities. Millions of impoverished rural people came in vain for a better way of life. The ruralized villages of Israel demonstrate a quite different option. It is possible to take the city to the farm. Industry and service organizations can be located near villages and employ rural people, without requiring them to move into the big cities.

In Israel, some planners even have begun to worry that these non-agricultural aspects may soon overshadow the rural base, much as happened to Israel's first villages - Petach Tikva and Rishon Le Zion. Only a few days ago, the Jewish Agency Executive decreed to block the growing tendency of non-farmers to purchase a Moshav membership. They are trying to stop people who have no intent to cultivate land to buy existing farms.

Measures to prevent the further erosion of the agricultural component of these villages were taken because in the country as a whole, full time farmers are now a minority. Among the approximately 20,000 Moshav members, 25% are ex-farmers. For personal or other reasons they no longer are actively engaged in agriculture. Another 25% are part-time farmers, who hold outside jobs. Still other are professional and service personnel.\*

The task that now confronts Israel's national and regional planners is to devise effective control point techniques to maintain a balance of agricultural and non-agricultural pursuits in the rural areas. More can be done to attract more people to live in the Galil and the Negev regions. It can be done by moving work to them instead of moving people away from the least crowded areas into the less and less manageable Megalopolis. This will call for a revision of the current Moshav and Kibbutz ideology which still thinks of farming as the exclusive economic and social base of village, at a time when this has ceased to be their reality. The ideology has not accepted the realities of Rurbanism. Many Israeli villages now provide their population with some of the economic and cultural options of suburbs. Yet their population still can enjoy the advantages of rural life, like individual homes instead of apartment dwellings. Planners often over-emphasize the role of government in the planning process. Our data show that citizens can and do modify the plan in terms of their own economic and social objectives.

Planners can propose. People have the power to dispose.

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\*Avraham Rabinovich, "Agency Says no to Gentlemen Farmers", Jerusalem Post, December 15, 1977.

## Introductory Note

Three papers presented at this panel all deal with measures needed to protect and enhance the quality of life in urban areas, but each deals with a different aspect of the subject.

The paper by Dr. Uri Marinov, entitled "New Trends in Land Use Planning - The Environmental Input" approaches the subject from the widest angle and, as its title implies, emphasizes the environmental aspect of planning. The author notes that opportunities to merge traditional planning with environmental protection now exist and should be fully utilized.

Through a merger of land use and environmental planning efforts, protective measures can be incorporated in the decision-making for individual development proposals. This will permit implementation of controls through the planning process that may help to eliminate or reduce pollution at its source, intercept pollution en route from its source to recipient areas, and lower the level of sensitivity to the impact of pollution in the recipient area.

As a corollary, a modern planning system should set priorities for action that will restrain in its sweep, at varying levels of detail, large national projects or proposals, regional efforts and even local actions that may prove environmentally damaging.

We already see, Dr. Marinov argues that, developers and planners in cities and industries are learning to think more broadly, both spatially and in terms of holistic ecological patterns. They are learning to care not only for the immediate project in hand, but also for the secondary, cumulative and synergistic effects in the broader context of the region, in the nation and ultimately in the biosphere.

In conclusion of his paper, Dr. Marinov outlines a system of plan evaluation and environmental input into the decision making process proposed on the national, regional and local level.

A specific aspect of this environmental input is dealt with in the joint paper by Dr. Rachelle Alterman and Prof. Morris Hill, entitled "The Problem of Setting Norms for Public Facilities".

The present practice, the authors find, is to set norms or standards for the allocation of land for public purposes, which norms are to serve as a guide to planners and as a basis on which the planning authorities can determine the acceptability of plans submitted for approval.

Norms have been used in numerous countries for many years, and are characteristically expressed as a simple inflexible measure of area per given size of population or total size of planned site. From such norms, however, it is impossible to know the justification for such land allocation in any particular instance - whether

functional, economical, behavioral, social, psychological or environmental.

The authors see the need for the introduction of flexibility into the said norms, so as to permit variations in accordance with the characteristics of the situation, variations with respect to the interaction between subsystems of health, education, open space, etc., and discretion on the part of policy makers with respect to alternative solutions.

In proposing an approach to developing a set of norms whose justification is clearly articulated, the authors outline a procedure that is based on a logical process of thought. The point of departure is the identification of the goals which the public services are intended to support. From these are developed a set of criteria which are operational expressions of goals. In addition, a set of activities and functions provided by the service are identified, as well as a set of variables - social, economic, physical, institutional, environmental, functional and psychological. The interrelations of functions and activities are analyzed in order to determine the implications for their joint spatial allocation.

A still more specific aspect of the overall subject of land use evaluation is taken up in the paper by Eng. Arlo Woolery, entitled "New Methods for Financing Urban Growth". Since meeting the environmental needs outlined in the other two papers inevitably narrows down to the provision of funds, it is essential to know how to obtain them in an adequately organized community.

To illustrate up-to-date methods of such financing, Mr. Woolery chooses as an example the urban financing methods now in use in the U.S.A. He defines and describes five historic methods in use, namely - Pay as you go; General obligation bonds; Revenue bonds; Special assessments; Hybrid bonds.

After explaining these five methods, the author notes that they have recently been supplemented by what he calls "Tax increment financing". When a redevelopment plan is adopted, assessed values of all property within the project area are determined. In succeeding years, property taxes are levied, as before, for the benefit of all taxing agencies. However, these agencies receive only the amount of revenue generated by multiplying the current tax rate by the assessed value in the year prior to the redevelopment plan's adoption. All revenues generated from increased value within the redevelopment area are earmarked to support the bonded debt for improvements and land acquisition within the redevelopment project area.

Mr. Woolery illustrates the working of this new method by the example of the State of California, where highly satisfactory results are obtained. He concludes by advising that communities should be investing tax increment funds in projects that would stimulate private development, since incremental property tax revenues must come from taxable values added through private investment.

# The Problem of Setting Flexible Norms for Land Allocation for Public Facilities

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## THE PURPOSE OF NORMS

According to what criteria should land be allocated for public purposes, such as education, health, outdoor recreation, etc.? This question continually exercises planners throughout the world and it is to satisfy this need that norms or standards for the allocation of urban land for public purposes have been proposed.

Norms or standards for the allocation of land for public facilities are typically used for the following purposes:

- as guidance to planners preparing master plans or site plans with respect to the size of sites and their location for the various public services;
- as a guide for determining the scale of land assembly for public purposes; (in Israel the planning authorities can expropriate up to 40% of land area for public purposes and there is a proposal to increase this to 60% in cases of high density).
- as a basis by which the planning authorities can determine the acceptability of plans;
- as a mechanism for co-ordination among various authorities with overlapping responsibilities.

Norms have been used in many countries for many years. In the U.S. the booklet of standards entitled Planning the Neighborhood<sup>1</sup> published by the U.S. Public Health Association in 1960 and later updated has been very influential. Standards for sports and recreation and open space use have been enunciated by the U.S. National Recreation Association and the Federal Outdoor Recreation Resources Commission<sup>2</sup> and other bodies. In the U.K. such norms are published by the National Playing Fields Association. In Holland, the national planning department, the Rijksplanologische Dienst published a comprehensive set of norms in its book Urban Land Units in Urban-Environmental Units in 1975.<sup>3</sup> In the Soviet Union the authority is Davidovich's Planning for Industrial Districts. In Israel, the first set of norms was published by an interministerial committee of the Ministers of Housing and Interior and the Association of Architects and Engineers in 1964,<sup>4</sup> and updated in 1975.<sup>5</sup> Sectoral norms have also been developed for recreation facilities by the Ministry of Tourism, for sports facilities by the Sports Authority and for educational facilities by the Ministry of Education.

The use of norms for the allocation of lands for public services has typically been criticized on two accounts. Critics such as the urban sociologist Herbert Gans<sup>6</sup> assert that these standards usually reflect the interests of the suppliers rather

than the users. Gans' study of park areas in New York shows that a small part of the ascribed target population actually used the facilities. He does not however recognize that the standards may reflect benefits other than direct user benefits. Open space provides psychological benefits - visual and aesthetic benefits and benefits that are derived from the knowledge that it is there. Furthermore open space may over time attract more users - in the sense that the supply of a good may generate its own increasing demand. Neither does the criticism recognize possible ecological benefits, such as noise reduction, enhancement of the micro-climate and mitigation of air pollution.

The second type of criticism is that of the market economists<sup>7</sup> who state the case for replacing public allocation of services by allocation through the market process or, at least, a quasi-market process. The problem is, of course, that for the most part, public services are by definition, public goods or collective goods which cannot be allocated through a market process, except marginally. In fact many of these public services have become just that, since their allocation through the private market process would be inefficient or otherwise injurious to the public welfare. Some of the public services such as education, health, sports and outdoor recreation facilities have been deemed by economists such as Musgrave as "merit wants"<sup>8</sup> whose allocation and distribution is a public responsibility. In such cases there is no alternative but to develop norms or standards for the public allocation of these services. The very description of the land allocation for public services as a norm or a standard implies a normative or policy basis for it.

How are such norms developed? Typically, they are handed down as "rules of thumb" from one situation to the other, adapted by cumulated experience. Such norms are characteristically expressed as a simple inflexible area per a given population, sometimes also including locational specifications. From the norms as usually expressed, it is impossible to know the substantive justification - whether functional, economic, behavioral, social, psychological or environmental. Therefore, there is no way of modifying them to meet particular situations in a reasoned manner.

What is needed is a more rational approach which recognizes that norm-setting must be flexible enough so as to enable the planner who is faced with a real-life situation, to adopt the norm which is appropriate to the problem. The research project in progress reported herein has attempted to apply such an approach to the problem of developing land norms for public services in Israel.

#### THE PERFORMANCE OF EXISTING NORMS

To what extent are norms met in practice? In a study of the actual allocation of land for public services in the 36 Israeli development towns<sup>9</sup> we found significant deviations from the norms as these were expressed in the 1964 Israeli prescriptions. We also investigated what possible factors can help to explain why some towns follow the norms less and others more.

#### Open Space, Recreation and Cultural Facilities

Compared with the norms there was under-allocations of land areas for neighborhood and town parks in 30 of the 36 towns, the average allocation in these towns being 59% of that prescribed. In 33 of the 36 towns there was under-allocation of children's playgrounds. In this case the average allocation was 34% of the norm.

Cultural and recreation facilities in 30 of the 36 towns were under-allocated at an average of 56% of the norm.

We further asked ourselves: what characteristics of the community affect the likelihood that it will have greater or lesser land allocations for open space or cultural facilities? To answer this question, we carried out a regression analysis using land area and floor area per capita as the dependent variables, with a series of socio-economic and locational variables as possible explanatory variables.

The findings showed that the lower the average socio-economic status of the population, the lower tends to be the allocation per capita of open space. This factor was especially important regarding playgrounds (accounting for 30% of the variability). It was also significant, although to a lesser extent for parks, sports and cultural facilities.

Thus the population living under more difficult conditions in their home environments was further relatively deprived when it came to the per capita allocation of open space for recreation and cultural facilities.

### Educational Facilities

By contrast, the situation regarding educational facilities was much better. In 30 of the 36 towns the standard land allocation for elementary schools was exceeded by an average of 160% of the land area norm and 140% of the floor-area norm. A different picture was presented by nursery schools where the average land area was less than the norm, averaging 69% of the norm. But in the case of floor-area, the average allocation was 85% of the norm.

Given the greater conformity to the norms in the case of educational facilities than in the case of open space and recreation, we were not surprised to find out from the regression analysis that socio-economic factors did not play a significant explanatory role. The variation in the allocation from town to town was found to be related to demographic variables such as age distribution and rate of natural increase, probably indicating that the allocation did not fully keep up with the changes occurring in the community over time.

How could the difference between open-space and education be explained? In Israel, educational services are in effect nationally financed and provided, the local municipality playing only a minor role, except in the kindergartens. In new towns especially, where construction is almost entirely by the Ministry of Housing and Building and where land is public, the Ministry of Education has few difficulties in obtaining sufficient land for its purposes. By contrast, in the case of open space and cultural facilities, there is no central authority in charge, and the responsibility falls on the municipality itself.

The point also needs to be made that the development towns were mostly built in outlying areas on nationally owned land, where the pressures against allocations of land for public services are inherently less than those existing in the older and larger cities. In the latter the more severe shortage of land for building and the pressures for maximum exploitation of land for building purposes by both private and public interests are much greater. Although a full set of data on these older cities is not available, all indications point to even lesser conformity with the norms in these towns.

Admittedly all sorts of other factors must have worked against larger allocations of land for public services. Among the most significant of these were lower expectations in terms of the level of public services in earlier years as well as a lower level of availability of financial resources for the development of public services.

The findings have taught us several things about the prevailing style of norms. The first lesson is that where there is a good chance that the norm will not be met when providing public services for weaker groups in society, the single standard per capita allocation might best be replaced by a range of values reflecting policy considerations. Thus, for example, one might recommend a higher norm for cases where the norms are less likely to be met. The second case is that the allocation of land for public services should take into account that communities may change over time. Another deficiency in current practice is the tendency to provide a single number, with no accompanying rationale which could be used as a basis for the exercise of the planner's discretionary judgement in the particular situation under consideration.

#### THE PROPOSED APPROACH

In the light of this situation we have tried to review the prevailing approach to the determination of norms in a study in which we are presently engaged. We have attempted to strengthen the theoretical basis for the determination of norms even though there are inevitably many gaps in present understanding and knowledge.

Our point of departure was the attempt to develop the norms on the basis of logical analysis of the goals and functions of public services in the light of the constraints and variable conditions that they must meet. Among the basic changes that we have tried to promote are:

- The introduction of greater flexibility into the norms, the flexibility being considered from four points of view which will be subsequently described.
- The attempt to anchor the norms in a logical deductive process based on theoretical analyses informed by behavioral information, to the extent that it is available, and corroborated by expert judgement. Inevitably the norms will also reflect policy positions of the government authorities.
- The development of norms using a format which is not rigid and which can reflect greater understanding of the activity, additional behavioral information or change in policy.
- The introduction into the norm not only of the area per person but also considerations of location, distribution and qualities of the land area allocated.
- Considerations of environmental quality. These are considered both with respect to the positive function to be fulfilled by the facility, such as a park, and with respect to minimizing negative environmental effects resulting from the location of an activity, such as noise from areas where crowds congregate.

#### Flexibility is introduced into the Norms from the Following Points of View:

Flexibility with respect to the characteristics of each community in terms of social, demographic, physical, environmental, institutional and economic variables. This means that if an activity is regarded as "sensitive" to a given variable pertaining either to the demand side (e.g. socio-economic characteristics of the population, mobility, climate) or to the supply side (topography, other existing facilities), then these variables should be reflected in the specifications of the



norms (Fig. 1).

$$” \sum_{i=1}^n \square \Delta i + \diamond + P_0 = \text{NORM} ”$$

Fig. 1

Flexibility with respect to changes in the results that may occur over time. Although the norm itself cannot, of course, be tailored to fit future and uncertain conditions, such possible conditions could be taken into consideration. For example, if the need for recycling educational facilities as the community ages is built into the norm, conversion might be more economical. Or if greater demand is foreseen, the recommended courses of action could become part of the norm. For example, a set of possible scenarios or trajectories of change might be constructed and their implications could be pointed out, so that the planner would be able to identify that scenario which is most likely to typify his community (Fig. 2).

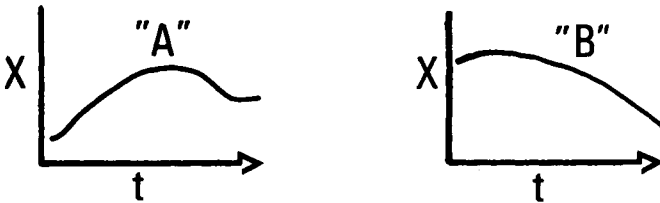


Fig. 2

Flexibility with respect to the allocation of facilities so as to reflect the interaction within and between subsystems such as outdoor recreation facilities, health facilities, educational facilities, cultural facilities. This can be particularly helpful in enabling the decision-maker to set priorities in a situation of tight land or other resources.

Facilities may be substitutable. Because of their complementarity it may be possible to locate facilities on the same land area or in the same building either simultaneously or subsequent to each other. All of these are important considerations in the case of scarce resources. For instance, by analyzing recreational activities in the terms of attributes such as: group or individual orientation; attraction of crowds; involvement or detachment; activity or passivity; contact or distance; indoors or outdoors; requiring artificial land cover, etc. it is possible to identify those activities which could be substitutable - i.e. successively use

the same land area or could be propinquous.

This sort of analysis could bring one to the conclusion that the same land area could serve volleyball, basketball or handball. A complementary analysis could point to the possibility of providing facilities which might serve one part of the community (e.g., school-children) earlier in the day and another part of the community later in the day.

Flexibility so as to enable the policy-makers or planners to exercise their own discretion with respect to alternative policies. In fields such as education, points of view differ about the desired policy in terms of organization, scale, and such issues as integration and degree of involvement in the community. In Israel the Ministry of Education does not have a unified position on these issues. There is no consensus on questions such as the desirability of multi-school campuses, the community-school concept, open education, age breakdown for school divisions, the desired mix between ethnic groups for the purpose of integration, etc. A given policy is a specific profile of these parameters. The method of setting norms should make it possible for the decision-maker to find a norm that suits the policy he selects. This type of flexibility could be achieved either by a norm that is general enough to apply to a number of possible policies, or else by constructing a set of alternative norms, each applying to a different "profile" of policy (Fig. 3). In the current state of our research dealing with land norms for public educational facilities we are attempting to apply both these approaches.

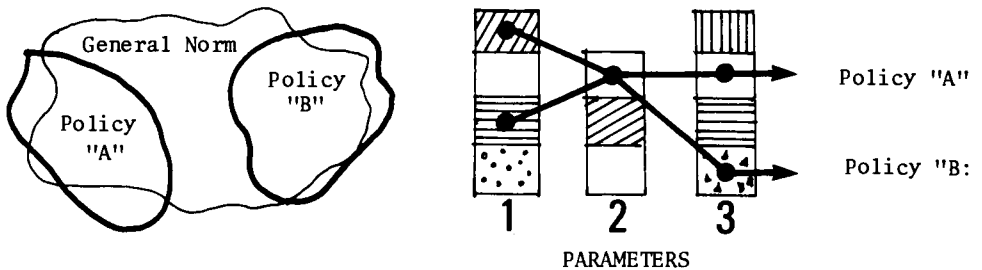


Fig. 3

### The General Approach

Our approach entails several steps. The point of departure is the identification of the goals which the public services are intended to support. From these are developed a set of criteria which are operational expressions of goals. In addition, a set of activities (things people do) and (latent) functions provided by the service are identified as well as a set of variables - social, economic, physical, institutional, environmental, functional or psychological. The interrelationships of functions and activities are analyzed in order to determine the implications for their joint allocations. (See Fig. 4).

The sensitivity of the functions and activities to the variables is then analysed on the basis of behavioral data and expert judgement conditioned by policy (See Fig. 5). The next step is the determination of variable norms for the allocation of space for public services reflecting the criteria and the sensitivity of the functions and activities to the variables. Allocation of land for joint use by various activities and facilities reflects the analysis of the interrelationship

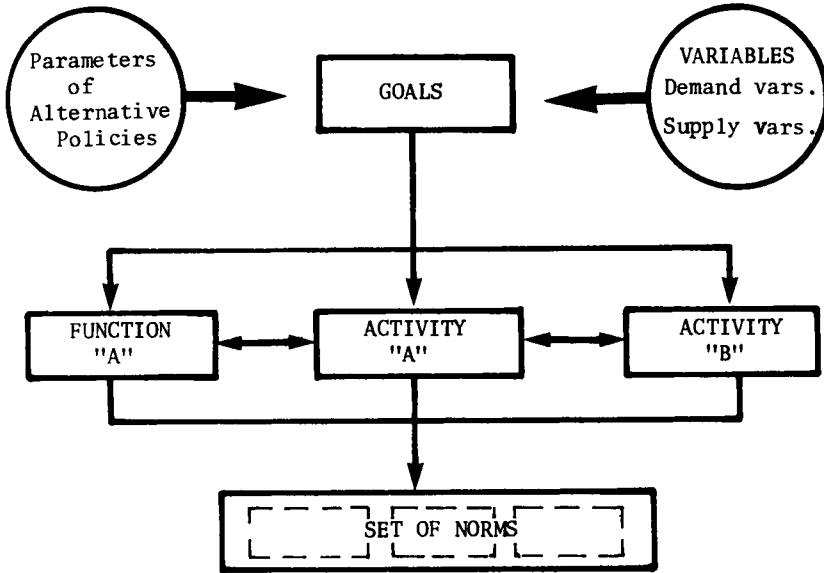


Fig. 4 The General Approach

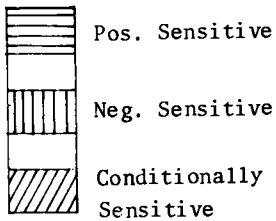
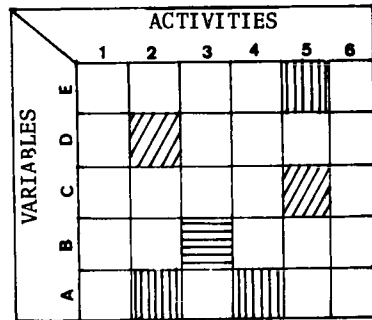
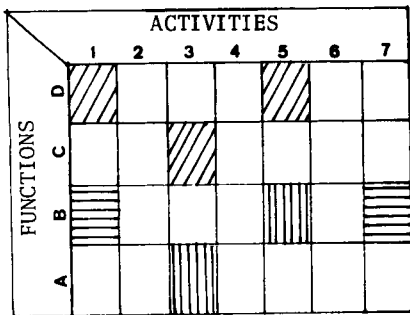


Fig. 5

between them. The possibility of alternative joint allocation is reflected in the norms. The norms are formulated so as to take into account possible patterns of changes in variables over time.

#### AN APPLICATION OF OUR APPROACH: NORMS FOR OPEN-AIR SPORTS FACILITIES

The first part of the study which is now in progress dealt with land norms for open-space and open-air sports facilities. We will demonstrate the approach as applied to the allocation of football fields. The goal which football facilities serve is the goal of active recreation (players), or passive recreation (spectators). Questions about demand are therefore central. The indirect functions of open-space (such as environmental enhancement), are largely missing in this case: on the contrary, football fields may have negative environmental effects. We have concentrated on the activities of playing and watching in order to determine possible demand. In scanning possible socio-economic variables which might be significant, we established that in Israel football is popular with all classes, ethnic and religious groups. The major significant variables were the age and sex distributions. Climatic conditions make little difference to demand. On the supply side, topographic conditions are important due to design specifications. In addition, the distance of the community in question from alternative facilities (i.e., its degree of isolation) and the availability of local public transport are important variables.

Believing that it is difficult and unnecessary to assess demand with precision, we used available data along with the judgement of experts, not in order to get exact probabilities of use by age, but rather in order to obtain a relative ranking of the various sports activities in terms of likely popularity by age groups. Football ranked first. We then obtained expert opinions on what would be the uppermost reasonable probability that a person from the potential population would participate in football on a weekly basis on the average. Assuming that demand is partially dependent on supply, this probability was raised so as to reflect government policy of encouraging popular sports activities.

The norm was finally set in terms of the potential population (defined by age and sex) which a given facility could serve. The concept of potential population forces the planner who uses the norms to estimate the existing and future ratios for the relevant ages in his communities. Thus, the norm is tailored to the community in question.

The variables of the supply side - degree of isolation of the town and availability of public transport - were introduced in the following manner. A policy decision was reached in conjunction with the government representative to the effect that smaller towns be compensated with respect to public sports facilities: even where the threshold population level does not justify such facilities, it was recommended that football fields, basketball and volleyball courts, and a swimming pool be provided.

The public transport variable was introduced as an element of the locational aspect of the norm. If the threshold population is not large enough within a 500m. walking radius recommended and no regular public transportation is available, football facilities should nevertheless be provided.

These guidelines enable the norm to be applied differently to different towns, based on the relevant variables. The locational variables also accord with the national policy of encouraging the distribution of the population to the smaller development towns. These towns usually have a large under-privileged population. Thus the norms have a compensatory effect on people who have to give up the benefits of

living close to the large centers and have a low degree of mobility.

### IN CONCLUSION

The approach reported upon in this paper for the development of norms for public facilities has already been applied to open space facilities. It is currently being applied to educational, health and cultural facilities.

Because the limit for land expropriation without compensation in Israel is set by law at 40%, the budget of public land usually available has a set ceiling at that figure or slightly higher depending on negotiations between the planning authorities and the developer. Therefore, at the final stage of the research a comprehensive view will be undertaken of all the land requirements, and a method will be developed for situations of scarcity of land whereby the decision-maker will have to make trade-off decisions about priorities among facilities to be provided or more intensive use of land through capital investment. Thus, the norms are a guide which the planner can either use as is, tailored to the characteristic of his community, or else he can view the norms as a first iteration of allocations and resort to the guidelines for making trade-off decisions where land resources are scarce.

### NOTES

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# **New Trends in Land Use Planning — The Environmental Input**

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## RELATIONSHIP BETWEEN PLANNING AND ENVIRONMENTAL QUALITY

In the early 1970's the first stage of recognising environmental quality as an issue in Israel consisted mainly of arousing awareness - of the public, of public representatives and of public bodies. Conflict situations, between the interests of environmental quality and economic development, were perhaps over-stressed, with extremist viewpoints, in order to focus attention on the issues. This first stage is over: the government has accepted that it has a responsibility for maintaining environmental quality; development interest groups (industry, construction, services) have accepted that they must incorporate environmental factors in their operations; and the public has shown that it is capable of expressing its dissatisfaction when it feels that the quality of its environment is being threatened.

The second stage is "how". How can the goal of environmental quality be best incorporated into the development processes of the country? How can the knowledge and views of government bodies, development interests and the public be brought together to seek solutions to pollution problems? How can the points of conflict be solved through attempts to reach a reasonable compromise?

In Israel, we are trying to achieve this stage by integrating environmental factors into the existing physical planning process. When an industrial process has not only been fully planned, but also constructed and put into operation, the options for incorporating environmental controls are very limited and often expensive. Moreover, an industry already in existence and contributing to both the economy and employment is unlikely to cease operations when it is found to be a cause of pollution. However, when an industry is in the planning stage, investment has not yet been committed and changes can still be made both in the technological design of the plant and in the selection of its site in relation to its natural surroundings. Industrial companies themselves are usually more amenable to incorporating controls when they are still seeking financial assistance for setting up the new plant.

## LEGAL FRAMEWORK FOR PLANNING AND ENVIRONMENTAL QUALITY

The existing physical planning system in Israel (which is based on the British town and country planning system) has always attempted to incorporate factors relating to environmental quality, though not always with much success. The legal and administrative framework exists; the question is how best to use it and, when necessary, modify it, to ensure that environmental factors form an integral part of the planning process and of the decision on day to day development projects by planning and building committees.

The planning and building law, in operation since 1965, defines 3 levels of

planning: national, regional and local. As in the British system, the right to develop land belongs to the State, and permission has to be obtained for almost any form of construction or change of use. The planning and building commissions at each level in the hierarchy, are empowered to decide what development they will, or will not, permit, and are required to prepare outline schemes to provide the basis for decisions on individual development proposals. Each level in the hierarchy requires the approval of the level above (for example, a local masterplan requires the approval of the regional commission) and decisions of the higher level are binding on the lower level (for example, a national plan overrides any conflicting proposals in a regional or local plan).

Until recently, the outline schemes concentrated on the spatial needs of land use activities (e.g. how much land will be needed for housing, for industry, for commerce) and on providing the infrastructure needed for enabling the activities to operate (e.g. roads, sewage disposal, electricity and water supply). They calculated the space requirements and sought sites which would meet the needs of each activity. Far less attention was paid to the resource side of the picture, with one exception. Throughout the law, strong emphasis is repeatedly placed on the conservation of agricultural land. However, this is the only requirement relating to resource conservation.

The whole issue of resource conservation could have been taken out of the planning system and dealt with separately. This is the situation in the United States, where the Environmental Protection Acts have created a separate system, focusing on the requirement for an Environmental Impact Statement. Israel has followed the European example of incorporating resource conservation within the physical planning process, to strengthen and not weaken the planning system.

However, the planning system has a weakness for environmental protection purposes. It adequately covers the incorporation of controls in the construction stage but it does not provide the means for incorporating controls during operation of the industry or activity, for example, it cannot incorporate the requirement for an air pollution monitoring system to check that air quality is not being degraded, or requirements for hours and operation to prevent noise disturbance. These operational controls can be required under a different law (the Law for the Prevention of Nuisances, known locally as the Kanowitz Law) which forbids the degradation of resources, including air, water and noise. This law was passed in 1961, but was found to be very difficult to implement. The Environmental Protection Service is currently formulating regulations to enable the ideals embodied in the law to be translated into practice.

#### NATIONAL MANAGEMENT OF RESOURCES

A significant advantage in Israel for the implementation of national policies relating to resource conservation is that most of the country's resources are in some form of public national management.

94% of the country's land resources are managed by the Israel Lands Authority, a government agency responsible to the Ministry of Agriculture. Almost all of the country's freshwater resources are integrated into the overall system of water supply, planned and managed by the Water Commission, also responsible to the Ministry of Agriculture.

Moreover, much of the country's development interests are publicly-owned companies operating on a national basis, for example, the electricity company. It should be easier to negotiate for the incorporation of environmental controls in the policy of a national body whose interests are in the benefit of the public, than to incor-

porate controls in multiple local bodies whose interests may not necessarily coincide with those of the general public.

#### NATIONAL MASTERPLANS

The centralization of development activities in Israel, together with the fact that the size of the country as a whole (both in terms of land and population) is perhaps only the size of a region in most European countries, has emphasized the role of planning at the national level. Whereas much effort has recently been focused on planning at the regional level in Europe, Israel has concentrated much of its efforts in national masterplans for specific subjects, such as:

- the growth of settlements
- the road network
- electricity supply and transmission
- quarrying and mining
- waste disposal
- nature reserves, national parks and landscape reserves.

The Environmental Protection Service in the Ministry of the Interior participates in the preparation of some of these plans, which will then provide the guiding context for specific development proposals.

An example is the electricity supply plan, where solutions are being sought to solve the conflict between the need for a coastal location for cooling water for power stations and the need to preserve the open coastline for recreation and tourism and nature conservation.

#### PLANNING AT THE REGIONAL AND LOCAL LEVELS

At the regional level, the separate national subject plans are integrated into a comprehensive land use plan for the area. Plans for six regions of the country are now in the final stages of preparation and approval, and should provide a framework for development control decisions. The framework is not complete - there are many subjects on which more detailed policy statements will need to be prepared. Meanwhile, much of the work of the regional planning and building commissions will continue to consist of evaluating development proposals individually. In this, the commissions are now assisted by environmental advisors, regional staff of the Environmental Protection Service.

At the local level, environmental units are being set up in local authorities to contribute to the improvement and maintenance of environmental quality. There are now 17 units in the country, and more are planned, established with the assistance of funds from central government and their responsibilities will include not only the environmental evaluation of development proposals, but also monitoring noise and air pollution levels and ensuring coordination between the departments concerned with environmental activities, such as sewage treatment and refuse disposal.

#### ENVIRONMENTAL IMPACT STATEMENTS

Whilst it is hoped that the main environmental factors will be incorporated in early stages of the planning process, it will still be necessary to check major development proposals individually for their potential impacts. The Environmental



Protection Service has therefore prepared guidelines for an assessment procedure to be incorporated in the existing planning process. The technical material is now almost completed, and an amendment to the Planning and Building law is being prepared to give legal backing to the requirement for an impact statement.

#### INFORMATION FOR ENVIRONMENTAL PLANNING

Evaluating impacts, and incorporating environmental factors into plans and policies, requires much information: on the availability of natural and man-made resources, their sensitivity to the impacts of land use activities and on the wide range of technological measures available for reducing or eliminating adverse impacts at source, enroute from the source to the recipient area or protective measures within the recipient area. As this information becomes available, and is organised and handled in a way which can assist in plan making and decision making on development proposals, it should significantly help in ensuring that the idealistic goals of environmental quality become an operational objective. With this in mind, the Environmental Protection Service has started a data collection system for natural resource evaluation for the country, initially using a manual system but now being changed over to a computerized system. One benefit of this system should be the ability to check where a development proposal in one local authority could have severe impacts in the area of another. Administrative boundaries between local authorities are not related to such natural units as drainage basins or airsheds, and therefore a significant change in conditions in one authority could well interfere with conditions in another.

#### ENVIRONMENTAL MANAGEMENT

The approach being developed in Israel is one of cooperation with development agencies to demonstrate that requirements for environmental protection are not contradictory to the aims of economic development. Polarising the issues, advocating extremist viewpoints, only aggravates the conflict.

The protection of environmental quality is not a luxury but a concept compatible with promoting economic development and can be incorporated in the forward planning and ongoing maintenance of development activities.

# New Methods of Financing Urban Growth

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## INTRODUCTION

Before going on to a discussion of tax increment financing, a method of funding urban development that has gained favor during the past quarter century, it might be well to review the traditional methods of urban finance now in place in the United States. These are:

1. "Pay-As-You-Go": Under this method, local governments use current tax revenues for current expenses and even for major public improvements. Obviously, large capital investments would require very heavy tax burdens in the year in which the investment was made. Therefore, this type of financing is seldom employed for major projects.
2. "General Obligation Bonds": In this type of financing, the full faith and credit of the issuing jurisdiction is pledged as security to the bond holders. Payments of both interest and principal are made from the general funds of the jurisdiction. In many cases, there are special property tax levies which are earmarked within the general fund for the retirement of the general obligation bonds.
3. "Revenue Bonds": In this type of financing, the payment is made to the bond holders from the net income generated by the project to be financed by the bonds. In this case, the project property itself is pledged as security to the bond holders.
4. "Special Assessments": In this type of financing, the project repayment is made from special levies against all properties within the district benefitting from the project. (This particular type of financing is not practical for redevelopment area improvements.)
5. "Hybrid Bonds": This particular type of debt instrument combines features of both the general obligation and revenue bonds. It is intended that the primary payment source be the revenues generated by the project, but additional security for the development is provided by a full government guarantee of the debt.

These five historic methods for financing urban growth have recently been supplemented by "tax increment financing." The State of California has been the largest user of this type of redevelopment finance vehicle. Currently in that state alone, there are more than 50,000 urban acres being developed under tax increment financing plans. Other western and midwestern states have also begun to use this type of financing for redevelopment projects.

Under tax increment financing, when a redevelopment plan is adopted, the assessed

value of all property within the project area is determined. In succeeding years, property taxes are levied for the benefit of all taxing agencies within the project area. However, these existing agencies receive only the amount of revenue generated by imposing the current tax rate on the actual assessed value of the area in the year prior to the redevelopment plans' adoption. All or a major part of the revenues generated from the increased value within the redevelopment area are earmarked to service the bonded debt for improvements and land acquisition within the redevelopment project area.

In the State of California, urban redevelopment projects under tax increment financing vary in size from less than 5 acres to more than 2,400 acres. To illustrate how tax increment financing might work, let's take the following example: A 50 acre area in an older seaside city with rundown housing and some rather small old commercial establishments...assume the current assessed value is \$2 million and the present tax rate is 3% on assessed value. In this example, current property tax revenues from this area would be \$60,000 per year. Under a projected redevelopment plan, this area would support 600 new housing units and 28,000 square feet of commercial space with sufficient parking space for residential and commercial needs. If this development were carried out, the projected assessed value of the developed area would be \$6 million.

If we assume no change in the 3% effective tax rate, revenues after development would be \$180,000 a year or an increment of \$120,000 a year over those of the base year. If the city were able to float its bonds at a capitalization (principal and interest) rate of 10%, these new tax revenues would support a bond issue of \$1,200,000.

This money could be used to acquire land for open space or recreational use to construct streets, curbs and sidewalks, public buildings, or even provide relocation housing for displaced families. Obviously, communities would be investing tax increment funds in projects which would stimulate private development since the incremental tax revenues must come from tax values which are added through private investment.

#### HISTORY

We now have about 25 years of operating experience in financing urban redevelopment through earmarked revenues from increases in assessed value resulting from the development itself. Tax increment financing goes back to 1952 when the State of California approved by state-wide referendum a constitutional amendment permitting the legislature to provide for tax increment financing of redevelopment projects by officially constituted redevelopment agencies. The first official agency was formed four years later in the City of Sacramento.

In 1956 the Sacramento redevelopment agency sold its first issue of tax increment bonds totaling \$2 million. Since that time within the State of California there have been nearly 100 issues of tax increment bonds sold with a total value approaching \$400 million. To date, there have been no defaults on tax increment bonds issued in that state. Up to the present time, the western states of California and Oregon have been most active in financing urban development through the issuance of tax increment bonds. However, in the last three years three other western states, Nevada, Colorado and Utah, have enacted legislation to provide for financing urban redevelopment through the tax increment method.

### CONCEPT

The concept of tax increment financing is a market-oriented response to the problem of decline in central city areas. In many American cities development of large suburban shopping centers virtually wiped out the retail trade in older downtown areas. The initial government response to this problem was the Federal Urban Renewal Project under the auspices of the United States Department of Housing and Urban Development (HUD). This federal agency made large amounts of funds available to local redevelopment agencies long before any effective re-use of central city land had been specifically established with identified developers and definite plans in mind.

In the absence of true market responses, these local redevelopment agencies followed the HUD handbook and acquired and cleared large amounts of land. This took land off the tax rolls, displaced many residents and businesses and then left the problem of searching for someone to develop the land. This course of action was dictated by the requirements of the urban renewal handbook and loan and grant contracts with HUD rather than the real needs and requirements of the communities involved.

This detachment from the market place and its requirements and restrictions often resulted in setting sales prices too high to justify profitable development of central city land and as a result a year ago HUD was faced with a problem of disposing of about 90,000 acres of land owned by redevelopment and urban renewal agencies. These lands were acquired with HUD funds and had been cleared as part of the urban renewal process across the country. Much of this land had been removed from the tax rolls more than 10 years ago and people and businesses had been away from it for so long there were no longer any real geographical ties or area loyalties to bring retail businesses and customers back into these urban areas.

### THE ROLE OF THE MARKET

The California legislation authorizing tax increment financing for urban redevelopment has some built-in safeguards against some of the ills engendered in the earlier programs financed by the federal government. These built-in safeguards include the requirement that a redevelopment agency conduct feasibility studies that actually test the viability of its projects against the harsh requirements of the real world. Agencies were forced to consult with real estate developers, real estate lenders and sophisticated bond buyers at every step of the planning process. There is a strict requirement that before a redevelopment agency can sell bonds to be paid with tax increments, it must prove that there will be a sufficient increase in assessed value in the project area to create enough extra tax revenue to pay both the principal and interest on bonds that are issued. If the agency is unable to prove that the assessed valuation will increase sufficiently, the tax increment bonds cannot be sold. This forces the agency into the position of having a specific re-use for land established and legally certain before it can obtain money to actually acquire, clear and prepare the land involved in the redevelopment project.

The pattern has been one of requiring the agency to sign a binding contract with a private or public developer which actually specifies the development to take place before there is any acquisition or clearance of land for the project. Only when the anticipated assessed value increase is specified in a realistic manner can the agency sell bonds to get funds for the acquisition, clearance and preparation of the land required for the development.

Obviously, a redevelopment agency cannot afford to have land within a given project area off the property tax rolls for a long period of time. The removal of land

from the property tax rolls means less assessed valuation which in turn means less in the way of incremental revenues from the property tax and hence less funds for the operation of the development agency.

#### BENEFITS

The substitution of tax increment financing for the previous federal government program under HUD may produce some additional benefits for society. The use of tax increment funds for urban development allows federal funds to be spent for other purposes. Those purposes might include the construction and rehabilitation of low income housing. This type of housing development accompanied by commercial and business investment in the same general area will produce customers for the business development. This concept of parallel development of residential, commercial, industrial, public and other structures or spaces appropriate or necessary in the interest of general welfare is part of the definition of redevelopment within the broader statutes enacted by the State of California.

#### LOCAL GOVERNMENT CONTROL

City and county redevelopment in California is part of the local planning process. The planning within a redevelopment project area begins with preparation of a general plan for the overall community. The responsibility for general plan preparation falls on the individual cities and counties, and the state statutes specifically provide that the redevelopment plan shall be an integral part of the local planning process and that the redevelopment activities do conform to the general plan for the area.

The rather broad statutes provide that planning procedures really permit cities and counties to accomplish redevelopment. One of the first requirements is a designated survey area. This must be a specific area within the city or county that requires study to determine if a redevelopment project is feasible within it. Then there is a selected project area which may be all or part of a designated survey area. The health and safety code portion of the statutes provides that the scope of a project area "need not be restricted to buildings, improvements or lands which are detrimental or inimical to the public health, safety or welfare, but may consist of an area in which such conditions predominate and injuriously affect the entire region."

Next there is the preparation of a preliminary plan which forms the basis for considering and preparing a subsequent redevelopment plan for the proposed project area. This plan is forwarded first to the county auditor and assessor to meet the requirements under tax increment financing. The preliminary plan must 1) describe the boundaries of the project area, 2) contain a general statement of the land area uses, layout of principal streets, population densities and building intensities and standard proposed as the basis for the redevelopment of the project area, 3) show how the purposes of redevelopment would be attained by the proposed redevelopment project, 4) show that the proposed redevelopment conforms to the master or general community plan, 5) describe generally the impact of the project upon residents thereof and upon the surrounding neighborhood.

As follow-up to the preparation of the preliminary plan, the redevelopment authority must next prepare an actual redevelopment plan which conforms to the city or county general plan and showing 1) the approximate amount of open space to be provided and the street layout, 2) limitations on type, size, height, number and proposed use of buildings, 3) the approximate number of dwelling units, 4) the property

to be devoted to public purposes and the nature of such purposes.

#### PUBLIC PARTICIPATION

In addition to these specific planning provisions, the redevelopment plan must meet the health and safety code requirements and also provide for public participation. When completed, the redevelopment plan must be submitted to the local planning commission for review and comment. Approval is automatic if the planning commission does not respond within 30 days. Following this step, the plan is submitted to the legislative body which has the responsibility for holding public hearings with adequate notice of those hearings provided to all land owners within the proposed project area.

Tax increment financing is the principal financial tool provided as a means of permitting cities and counties to accomplish redevelopment. However, there are auxiliary financing methods available to redevelopment agencies such as the borrowing of money, the advance of funds from city or county governments and the issuance of bonds for redevelopment purposes. The specific provision for discharging indebtedness incurred by the redevelopment authority is the increment in property taxes resulting from the development itself. This increment is measured against the fixed assessed value within the project area at the time the development plan is adopted. There is the specific provision that any property tax revenue produced by an increase in assessed value over the fixed or frozen base may be used by the agency to repay any indebtedness it incurs through the redevelopment project.

When all indebtedness is discharged, the property tax base is unfrozen and becomes the base as defined by the current market value within the project area and all property taxes are then paid to the local taxing authorities within the project area. Nearly 150 cities and six counties have actually established redevelopment agencies in California. In most of the cities and counties the city council or the county board of supervisors serves as the governing body of the redevelopment agency. In less than 15% of the cases have cities and counties chosen to have a separate governing body as the redevelopment agency.

The States' two larger cities, Los Angeles and San Francisco, have chosen to establish separate governing bodies to handle redevelopment responsibilities. In the case of these two major cities the redevelopment agencies were actually established before the constitutional amendment permitting tax increment financing was approved.

#### RECENT ACTIVITY

An analysis of the timing for various redevelopment projects indicates a large gain in momentum in the last few years. Over half of the redevelopment projects in California were established in 1972 or later years. This means that there has been as much activity in the past five years as there was in the first 20 years that tax increment financing became legal in California. Most redevelopment projects are still relatively small, but in recent years their size has been increasing. We have reasonably good data for 194 of the 229 city and county projects currently under way. These figures show that nearly 50% of the projects are under 100 acres in size and less than 20% involve more than 400 acres.

The amount of vacant land included in redevelopment project areas is quite small, but it has been increasing in recent years. In the projects analyzed 34% showed no vacant land, 45% had less than 5% vacant land, and only 23% of the projects had more than 25% of the land included classified as vacant.

Redevelopment activity under tax increment financing is producing some tangible results. More than 4,000 residential units have been made available in completed projects and nearly 24,000 additional residential units are presently under construction in project areas. More than 5 million square feet of leasable commercial and industrial space has already been completed in project areas and nearly 40 million additional square feet of leasable commercial and industrial space is currently under development.

A variety of public buildings have also been constructed within project areas, but generally such public buildings are not the principal redevelopment activity. These public buildings have generally included city halls, county courthouses, parking facilities, meeting facilities, fire stations, libraries, hospitals, police stations, health centers, child care centers and in one occasion a theater.

### CRITICISMS

Some detractors of tax increment financing seem more inclined to criticize what might happen rather than what has happened. A total of 18 redevelopment projects have been completed in 11 cities in one California county. Of the 18 completed projects, 10 use tax increment financing. In all 10 the project indebtedness has now been repaid and the total assessed value within the project area is available to local taxing agencies. In six of the 10 project areas it was possible to identify about \$24 million in increased assessed value after adjusting for inflation.

Most of the 220 city and county redevelopment projects currently under way are generating some tax increment revenue. At its present rate of growth this tax revenue should be sufficient to service the debt incurred in connection with the projects.

In some cases other taxing authorities are reaping immediate benefits from redevelopment projects. This occurs in cities which have adopted policies of using only 50% of the tax increment for the development authority and allowing the other 50% of the tax increment to be shared by the local taxing authorities. In other cases there have been special sharing agreements with counties, special districts and school districts. Also some of the bond indentures have provisions which allow revenues over and above the amount needed to service debt to flow back to all taxing agencies. If this type of operation becomes the rule rather than the exception, tax increment financing should gain widely based support from many government officials in cities which are experiencing declines in assessed value in central city areas.

Among cities and counties not using tax increment financing the following criticisms are frequently voiced: There is not statutory limit on the amount of taxable assessed value an individual city or county may freeze in conjunction with redevelopment activities. However, at the present time nearly half of the cities using tax increment financing have frozen less than 1% of the tax base and in only 8 cities out of 229 does the frozen tax base amount to more than 10% of the total tax base within the city. Problems have arisen where redevelopment projects do not proceed as planned and for some reason the city must make principal and interest payments out of its general fund in order to prevent a default. In these particular cases the default involved both tax allocation and lease-revenue bonds. To date, there has never been a default in conjunction with bonds issued by or on behalf of a California redevelopment agency.

IMPORTANT QUESTIONS

A recent California study on tax increment financing and redevelopment raised some important questions that should be considered by jurisdictions considering this method of financing urban growth and development.

1. To what extent should cities and counties be permitted to include vacant land within redevelopment project areas?
2. To what extent should cities and counties be permitted to finance the construction of public buildings and utilities with tax increment revenue?
3. To what extent should cities and counties be permitted to amend redevelopment plans after they have been adopted?
4. To what extent should the boundaries of a redevelopment project area be required to be contiguous with some existing political jurisdiction?
5. To what extent should the definition of blight be refined and made more specific?
6. To what extent is it desirable or feasible to use tax increment revenue for housing related purposes?

The same study looked into the criticism of various individuals who had examined the use of tax increment financing. These questions and criticisms were: 1) Are redevelopment authorities making sufficient use of tax increment funds for housing related purposes? 2) Is the definition of urban blight far too broad and does it permit tax increment financing to be used for almost any kind of project imaginable? 3) Should funds from tax increment financing be used for unrelated purposes outside of the project area? 4) Tax increments can be frozen for indefinite periods of time. 5) Project activities in subsequent years are financed with tax increments generated by the initial base year. 6) Much of the tax increment would have occurred anyway without redevelopment. 7) Increments from increased assessed values flow to redevelopment agencies even though no indebtedness exists. 8) Most tax increment projects do not comply with original legislative intent. They are aimed at encouraging development rather than redevelopment. 9) Project boundaries are intentionally drawn to capture assessed value that does not actually result from the redevelopment project. 10) Tax increments are used as a substitute for normal capital improvement programs. 11) It is possible to create entirely new projects by amending or expanding existing projects. 12) Tax increment funds should not include revenue generated by subsequent tax increase. 13) Too much development activity has involved the development of vacant land. 14) Tax increments have been used to construct public facilities of benefit to the entire community as opposed to just the project area which bears the burden of the increased taxes on the increased assessed value. 15) There is no limit on the amount of taxable assessed value of a government entity that may be frozen as the base. 16) In many cases, redevelopment simply relocates or shifts problems from one area to another. 17) Tax increments are used to subsidize private developers who oftentimes are the primary beneficiaries. 18) There is no limit on the amount of increment an agency can obligate. 19) Tax increment financing encourages unhealthy inter-area economic competition and results in local agencies giving away more than is necessary to attract developers. 20) Tax increment financing has resulted in projects that benefit a specific development rather than the overall project area. 21) Tax increments have been used to subsidize the general fund since they produce additional



revenue without raising non-property taxes.

### SCHOOL FINANCE

Most vocal among the critics of tax increment financing are school officials who feel that tax funds are inevitably and wrongfully diverted from school and other taxing districts. For one thing, some of the increase in assessed valuation is attributable not to the redevelopment effort but simply to inflation. Also, some agencies deliberately draw their project boundaries to include sites which are already scheduled for private upgrading just to share in the increase in value. This particular increment can then be used to support redevelopment bonds even though the private project in question was planned entirely independent of the redevelopment agency's efforts.

### ARGUMENTS

The argument in this case against tax increment financing derives from the fact that redevelopment projects do nothing to increase demand for retail stores, apartments, offices and the like. (Very few people will buy more shoes because there are more shoe stores downtown!) The redevelopment agency increases the supply of new buildings in a particular site but some of this construction would probably have come into existence "elsewhere" had there been a market to support it. If the "elsewhere" lies outside the reach of the taxing jurisdiction affected, it is difficult to see how any taxing entity would be adversely affected. Advocates of tax increment financing argue that once the tax increment bonds are fully redeemed, the city and all the other taxing entities will be greatly enriched because they will be able to draw taxes from the value of the project for its remaining life. However, if the finance period is matched to equal the economic life of the project, it provides small comfort to taxing authorities, since the assessed value of the improvements on the development project should be reaching a minimum about the time the debt is actually retired. This would then leave just the land value in the tax base. The real question then becomes one of determining whether the tax yield available to the jurisdiction at the end of the financing period for the development project would offset the values of the tax revenues to the community if private forces had been left to do the redevelopment at even a slower pace.

### SUMMARY

In summary, tax increment financing is a device which allows, indeed encourages, localities to compete with each other for intense redevelopment. In doing so, it may complement the planning goal of encouraging greater concentration of development in already developed areas. The downtown redevelopment shopping mall may be able to vie with suburban malls, and it may even discourage private developers from continuing such facilities in remote areas if it is possible that local jurisdictions will create more conveniently located facilities in older downtown areas throughout the region.

Tax increment financing may also be used by small suburban jurisdictions to develop office, industrial and retailing facilities that would better serve regional needs and more central locations. As long as bond holders and developers can be persuaded that a site is economically viable, there is no further constraint on a redevelopment agency except that which is imposed by the local governing body itself. Since California cities rely heavily on property and sales tax revenues, they have little incentive to consider regional impacts unless one of the impacts is that their pro-

ject will fail to compete successfully with other developments, public or private, in the same market area. By and large, tax increment financing has not been utilized by smaller localities. One reason may be that they do not have the access to bond markets that larger cities enjoy. They may lack the staffing capacity and the sophistication. Their jurisdictional boundaries may not be large enough to assure sufficient protection from neighborhood and regional competition.

The tax increment device is among the very few tools available to declining cities for attracting new growth. The real question involved in tax increment financing is the discipline of the market place and the ability to avoid ruinous competition among localities.

One aspect of tax increment financing which must be researched before this method of financing urban growth can really be evaluated is that of preservation of existing tax base. Without redevelopment projects in central city areas what would happen to the existing property tax base? Under redevelopment this property tax base is frozen, and implicit in the debt retirement procedure is the assumption that it will remain stable and that taxes on the added assessed value will be sufficient to pay off the redevelopment debt. If there were no redevelopments within the area, would the existing tax base decline and cause tax delinquencies with attendant problems of abandonment of derelict structures that would eventually become the responsibility of local government? Until the benefits of preserving and upgrading the existing tax base have been carefully analyzed, we may be unable to evaluate the true benefits of tax increment financing as a tool for funding constructive urban growth and development.

## Introductory Note

An essential element in determining the quality and therefore the value of a housing scheme is the measure of the occupant's satisfaction with his dwelling. In his paper on this subject, entitled "Habitability - Occupant's Needs and Dwelling Satisfaction", Prof. Dan Soen analyses the notion of "housing quality" and notes that the occupier's satisfaction with his apartment is a composite result of a whole series of factors that make up a complex system.

The variables of importance that are prominent in this system are the size of the apartment and the number of rooms in it, the level of services and equipment, privacy and environmental quality. In the final count, the occupier's satisfaction with his apartment depends on the degree to which it meets his basic needs. These basic needs are, in turn, a function of two factors - the life cycle of the occupant and his life style. The essential stages in the occupier's life cycle will depend on whether his family is a newly-established one, whether it has younger or older children and whether the children have grown up and left their parents who will then form a contracting family. The occupant's life style is an outcome of such factors as culture, socio-economic status and character.

Prof. Soen concludes his paper by indicating an order of priorities of occupants' needs, as proposed by another author for people of modest incomes. These needs, enumerated in the order of their relative importance to the occupant are: sufficient internal space; quality of rooms and building materials; privacy from outsiders; privacy within the apartment; internal appearance of the apartment and external appearance of the building.

A more formal approach to the subject of housing quality is adopted by Dr. Nava Pliskin in her paper entitled "A System Approach to the Evaluation of Housing". In her opening remarks, the author states that the worth of a housing plan is some combined measure of its performance in the functional, technological, economic, perceptual, aesthetic and sociological contexts.

Dr. Pliskin proceeds to indicate a systematic method whereby decision makers can decide on their selection among possible housing plans. A hierarchy of housing elements, which takes the graphical form of a tree of several levels, is proposed. Starting from the outer branches of the tree, each node is considered, and the relative importance of each branch is quantified so that the resulting weights sum up to 1.

To evaluate a housing alternative, satisfaction from each element is determined and multiplied by the respective weight. Once all multiplications are available, different summations yield evaluations of sub-systems and of the whole system. In this way, the proposed model offers the decision makers a decision aid that brings down the estimate of dwellers' satisfaction to a simple quantity.

Motivation for an evaluation model, Dr. Pliskin concludes, should result from

realization of the arbitrariness, subjectivity and bias of intuitive evaluation. Thus, the proposed evaluation (via elementary components) should raise the quality of decision making.

One such elementary component - that of housing costs - is taken up by Prof. David Pines in his paper on "Home Ownership, the Rental Market and the Cost of Housing". The author notes that in many developed countries the share of the free rental market tends to decline, as against the share of the owner-occupier units which tends to increase. One of the reasons for such decline he sees in the discriminatory treatment of the rental market by the income tax system and by the credit arrangements in vogue.

A case in point is the position in Israel, where only six percent of the apartments are leased to tenants in the free market. Prior to World War II, the rental market was widespread, but shrank after the introduction of rent control.

Prof. Pines proceeds to examine the commonly held view that the heavy burden falling upon the purchasers of apartments can be alleviated if the rental market is revived. In this connection, he notes that programs have been developed for subsidizing appreciably construction for housing.

The author arrives at the conclusion that housing consumers belonging to some socio-economic groups can benefit from a wide rental market. If, however, its development depends on subsidies, this indicates that revival of the rental market would be rather disadvantageous.

The warranted measure that should be adopted is the abolition of the existing discrimination against the rental market, which is inherent in the tax system and mortgage policy. If these kinds of discrimination disappear, and if the rental market can really be beneficial, then it would be autonomously developed as a result of market forces.

# Habitability — Occupant's Needs and Dwelling Satisfaction

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## HABITABILITY AND OCCUPANT'S SATISFACTION

The literature dealing with the determination of the standard measurement of housing is fairly abundant.<sup>1</sup> The basic problem of anyone trying to deal with the general analysis of the subject is that the approaches found in the literature are rather specific; this means that some studies concentrate on the social aspect of the subject while others deal with the economic aspect, and others again examine the political aspects or the environmental, pathological, psychological, physiological and even anthropomorphic aspects of the housing subject.<sup>2</sup>

Only a small part of this literature deals with the subject in an overall approach,<sup>3</sup> the reason for this limitation probably being due to the fact that those dealing with the problem of occupants' satisfaction with their apartments have not yet developed dependable research methodology accepted for the overall study of habitability.<sup>4</sup>

In the final count, one may say that anyone dealing with the housing problem faces a much more complex problem than the provision of shelter. Housing quality is influenced by a whole series of factors - engineering, social, behavioral and others,<sup>5</sup> as has been formulated by Amos Rapaport.<sup>6</sup>

"The house is an institution, not just a structure, created for a complex set of purposes. Because building a house is a cultural phenomenon, its form and organization are greatly influenced by the cultural milieu to which it belongs. Very early in recorded time, the house became more than shelter for primitive man, and almost from the beginning, "function" was much more than a physical or utilitarian concept. Religious ceremonial has almost always preceded and accompanied its foundation, erection, and occupation. If provision of shelter is the passive function of the house, then its positive purpose is the creation of an environment best suited to the way of life of a people - in other words, a social unit of space."

The same complexity finds its expression in the statement by Max Sorre that the house is the physical expression of what he calls Genre de Vie - a term which embraces in his view all the cultural, spiritual, material and social factors affecting the apartment.<sup>7</sup>

Furthermore, the quality of housing is not static, since it varies in accordance with different circumstances. Since the occupant's satisfaction is not absolute it follows that the quality of the dwelling unit or the occupant's satisfaction at a certain point in time can be defined only in relative terms.<sup>8</sup>

The actual satisfaction of the occupant can be defined in two ways - as a clear explicit declaration by the occupant that the apartment pleases him, or as the absence of a complaint regarding the apartment when an opportunity to complain is given to the occupant.<sup>9</sup>

As stated, the number of studies that have dealt with the problem of occupant satisfaction with the apartment is great and wide. Since this question is intimately connected with the subject of housing quality, all the aforesaid on this question is valid to the same extent also with regard to the question that confronts us - most studies do not adopt the overall approach. In different studies one finds, therefore, a positive correlation between the occupant's satisfaction with his apartment and various factors.

Thus, for instance, Moge and Morris have found that satisfaction depends on a whole system of beliefs and opinions that the occupant entertains in respect of his dwelling and which are not connected with its physical characteristics.<sup>10</sup> Riemer connected this satisfaction with the value of the apartment in the market.<sup>11</sup> Back has stated that a condition for satisfaction is ownership of the apartment as against rental of one.<sup>12</sup> Rossi came to the conclusion that satisfaction is a function of the occupant's neighbors or of his opinion of them.<sup>13</sup> A whole series of investigators have maintained the opinion that satisfaction results from the proximity of friends or members of a related group in the neighborhood.<sup>14</sup> Reimer and Cottan saw in the area units per head the point of departure for satisfaction.<sup>15</sup> Moge and Morris thought that the number of rooms per family is the one that determines satisfaction.<sup>16</sup> Chapin pointed to the availability of space for different uses as the one that determines satisfaction.<sup>17</sup> Morris and Moge make satisfaction dependent on the possession of a private bathroom and kitchen;<sup>18</sup> on the other hand, Wilner, Walkley and Cook considered such a selection to arise from the absence of various nuisances (such as rats, insects, etc.),<sup>19</sup> whereas Oates maintained the opinion that the level of services supplied by the local authority is a contribution to satisfaction.<sup>19a</sup> Again, Gallogy saw the habitability, convenience of the apartment and the physical appearance of the surroundings as a decisive factor for satisfaction.<sup>19b</sup> In later studies attempts were made to adopt overall approaches while using more accurate techniques. It was found, as a result, that satisfaction is a function of a whole series of factors. Thus, for instance, Western, Weldon and Tan Tsu Haung adopted the technique of factor analysis in their examination of occupant's satisfaction in Singapore, and found this satisfaction depended on nine main variables in the following descending order: sanitary facilities, washing facilities, cooking facilities, size of apartment, living rooms, ventilation, noise factor, refuse disposal services and cleanliness of the neighborhood.<sup>20</sup> The first-named source, which contributed a considerable weight to these variables, substantiated about 25% of the variability of the factors which account for satisfaction with the surroundings. Within this basket of factors the quality of transportation covered 14% of the variability, quality of schools and availability of services 7% each, safety and cleanliness 5%.<sup>21</sup>

On the other hand, Onibokun adopted a systematic approach for measuring two indices, one of which he called the relative habitability index (RHI) and the (RSI).<sup>22</sup> His indices included in all 74 variables out of which 28 belonged to the dwelling subsystem. The most important characteristic that transpired from the analysis of the occupant's replies within the scope of examination of this subsystem were, in descending order, as follows: adequacy of the internal space - number of rooms and their size; adequacy of the dwelling equipment - washing facilities, storage and cupboards; type of apartment; other apartment characteristics; physical quality of the apartment; and, lastly, privacy in the apartment.

The positive correlation between the above-mentioned variables and the satisfaction with the dwelling appears logical enough, and in some studies one occasionally finds

confirmation of these correlations. However, one from time to time encounters findings that do not agree with one another.

Thus, for instance, it is found that the tenants in the houses provided by the American Ministry of Defence where the apartments were fairly spacious were less satisfied with their apartments than were the dwellers in old, less spacious, students' quarters.<sup>23</sup>

Again, in another study it was found that 6% of those surveyed (white-collar workers) lived in the same apartment as their relatives. 21% of those surveyed (blue-collar workers) also lived together with relatives. However, the ratio of complaints on congestion was inverse: 29% of the white-collar and only 6% of the blue-collar workers complained about housing congestion.<sup>24</sup>

Lastly, it can be seen from Back's study that persons who lived in high congestion were more satisfied with their apartments than those who lived in less congested dwelling units.<sup>25</sup>

The conclusion to be drawn from the aforesaid is that the dwelling units affect the satisfaction within the framework of a number of constraints.<sup>26</sup> One first has to take into account that the occupant's satisfaction expresses the difference between his previous dwelling and the present one. In other words, one person is likely to be less satisfied with his spacious villa in comparison with someone else's satisfaction with his small apartment. The differences in the satisfaction factor are likely to be due to the previous dwellings of the two people. Secondly, the dwelling desire by people corresponds to what they consider practical, and this is not too far away from what is already in the family's possession. Thirdly, since satisfaction is a function of a whole series of factors, various variables are liable to cancel each other out and to affect negatively the satisfaction of the occupant.

#### OCCUPANT'S NEEDS - GENERAL SURVEY

Be this as it may, also in the systematic approach the occupant's satisfaction with his dwelling depends, to a large extent on the key question whether the dwelling unit meets his needs. And since this is so, the question is asked, how is it possible to define the occupant's needs.

One should, first of all, state that the basic needs are a function of two key factors:

- the stage in the occupant's life cycle,
- the occupant's life style.

As to the stage of life cycle, Beyer has distinguished among four separate stages, each of which has a planning projection on the occupant's needs:<sup>27</sup>

- (a) The young couple stage - a young core family with no children;
- (b) Founding family - a couple with children below the age of 8;
- (c) Growing family - parents and children aged 8-18.
- (d) The contracting family - pair of aging parents, some of whose children have already passed the age of 18.

However, in general, one distinguishes between three stages in the life cycle:

- (a) Stage of growing family - the stage in which the core family is established and produces its offspring;

(b) Stage of contracting family - the stage where the children grow and begin to leave their parents' home;

(c) The static stage - the stage at which the children have left their parents' home, and the parents continue to live by themselves in the dwelling unit.

As to the life style, this is an outcome of a whole series of factors including culture, socio-economic status, character of the family (extrovert or introvert), etc.

Nevertheless, owing to the fact that the requirements vary from family to family in accordance with the interplay of the cells of life cycle stages and the life style (this interplay being capable of schematic representation in matrix), it is possible to speak of a morphological framework of the basic requirements, such as:<sup>28</sup>

- (a) Need for shelter and security;
- (b) Physiological needs;
- (c) Social needs;
- (d) Aesthetic needs.

As far as the relative importance of these needs is concerned, one may bring in here a citation from the book by Clare Cooper:<sup>29</sup>

"There is...one simple rule of thumb that pertains to choosing between conflicting needs. The most basic human environmental needs is for shelter; we are assuming that any housing design, however maladapted to the resident's social needs, will at least provide that. When people's shelter needs have been satisfied, they become concerned about security from outside threats, real or imagined. When the needs of shelter and security are taken care of, people begin to demand that their housing also fulfill needs for comfort and convenience. There may be little concern for exterior aesthetics, but considerable concern about having a house that is cozy and comfortable and easy to maintain.

At the next stage in the hierarchy of needs, when comfort and convenience are taken for granted, the house is seen as a locale for socializing and self-expression. Finally, when all these previous needs are taken care of, people become concerned about the aesthetics of their house and neighborhood...So, for example, if the choice is between aesthetics and comfort, the latter must come first; if the choice is between security and self-expression, the former must come first. That is, in a hierarchy extending from lower or more basic needs to higher or more specialized needs, from shelter, security, comfort, convenience, through socializing, self-expression, and aesthetics, a lower need must always take precedence over a higher one. Not until the lower needs have been satisfactorily met will the higher ones emerge into consciousness."

With regard to the spectrum of possible solutions in everything concerning the basic needs of man, here again there exists a fairly ramified literature.

Thus, for instance, there is a physiological basic need of man to breathe. The Eskimos do not see any contradiction between this basic need and the concentration



of pungent smells within their igloos and therefore take no planning steps designed to solve this problem of smells, a problem which a Western man would find an unbearable nuisance.<sup>30</sup> The same applies to the Japanese, to whom the smell of the privies is accepted as an inseparable part of the traditional home.<sup>31</sup> A hint to this can also be found in the Mishna: "Rich is the one whose privies is close to his table".

Again, there is a whole series of cultures where sanctity attaches to smoke and therefore this is also encouraged in the home. No contradiction is seen between the need to breathe, on the one hand, and the dwelling being enveloped in smoke, on the other hand.<sup>32</sup> Western culture, however, considers smoke a nuisance, although with different degrees of tolerance.

The same applies to the different attitudes to open windows and the fear of night chills in various cultures, which finds its expression in the planning of the house.<sup>33</sup>

Likewise, the attitude to darkness which the African tribe of Manaleke requires for religious observances results in houses planned to be kept in darkness.<sup>34</sup> Consequently, ventilation is also affected.

Another physiological basic need is the one for food, without which man cannot exist.

With the Aztec tribe the kitchen was placed in a separate structure. With the Incas cooking took place in an open courtyard, where the tribe of Tuardas in North Africa lit fires within the tents for warmth but cooked outside, and the Japanese cooked within a depression in the floor.<sup>35</sup> This is an additional example of different solutions to the same basic needs.

So much for physiological needs. However, there also exist other basic needs, such as social ones which include the family.

The family is a universal social institution; there is not a single culture where this institution is absent.<sup>36</sup> However, the composition of the family and its framework are varied and different. These variations, of course, affect the planning of the dwelling unit. The house intended for the whole family differs essentially from that intended for the extended family. The housing needs of a monogamous family are radically different from those of the polygamous family.

However, even when the same type of family is considered there are still various ways of meeting its needs. Thus, for instance, one finds the extended family within the tribe of Kabyles in North Africa, the Iroquois of the U.S.A. and the Southwestern Pomo of California.

In all the three tribes there exists the same basic social framework but, nevertheless, one finds entirely different dwelling units in them.<sup>37</sup> With the Kabyles the whole family lives in a house by itself but the inner core is common and is surrounded by a row of thatched houses which shelter in combination the extended family. A similar arrangement of houses around an internal core is also found among the Incas.

Among the Iroquois another order obtained, not the one of a central core, but one of a long house within which the various family units were concentrated on both sides of a giant structure 80 ft. long and 70 ft. wide. Along its length was a kind of public area and a central fireplace.

Among the Pomo Indians the families are grouped in yet another way - in the form

of dwelling clusters.

All these are examples which clearly show how it is possible to find different planning solutions for the same basic needs of man in a series of cultures.

One may note that there is no need to use technological or anthropological means and to refer to the cultures of primitive societies in order to prove the fact since this can be easily proved also in Western cultures. Furthermore, in the Western culture it is appropriate to look sometimes for different solutions to the same basic needs in order to solve the problem of different habits even when considering the housing of families who are in the same stage of the life cycle and which are situated in the same general life style. Thus, for instance, the eating habits are likely to affect the different planning requirements. The family which gathers for formal meals in the living room differs from the one which eats informally in the kitchen. The family that eats together at fixed times differs from the one in which each member takes food for himself as he wishes at any time of the day. Rapaport has pointed this out as follows:<sup>37</sup>

"The prevalence of the barbecue in Los Angeles affects more than just house form, since increasing use of the backyard, with its barbecue and swimming pool, makes it, and the house, more than ever the center of life."

There are variations in other parts of the dwelling and in their use, such as the bathroom. In the study published some ten years ago by Alexander Kira he points out that the form of the bathroom is an outcome of man's attitude to his own body, to the question of rest, privacy, etc.<sup>39</sup> In advertisements in the U.S.A. stress is often laid on the number of bathrooms in the apartment which sometimes exceeds the number of bedrooms in it.<sup>40</sup> The basic hygienic problems remain as they are but the importance attached to them and the forms of solutions found for them always differed in accordance with the attitudes and values maintained by man and not necessarily according to utilitarian considerations. This is what determines, for instance, the preference for shower or bath tub.<sup>41</sup> This brings us back to another one of the basic needs which are largely determined by the culture, although not less than by the character, of man: the need for privacy.

Although man is by nature a social being, he also needs privacy. The attitude to privacy differs in different Western countries, such as Germany, U.S.A. and Britain,<sup>42</sup> and even within those countries in different subcultures.

Be this as it may, in the process of massive urbanization which has encompassed humanity in the past century the urban design theory began to stress during the last two generations the preservation of man's individuality in an attempt to protect man from conformist pressures of group life. The prevalent attitude is that a good plan must preserve a suitable balance between the community and the individual. The theoreticians of garden cities (such as Gedys) intended to provide green open spaces for general use and maintenance for the community. The prevailing tendency at present is to establish in the town a spatial hierarchy: private space attached to the dwelling unit, for semi-private use by the group of neighbors and ending with public open spaces in the quarter.<sup>43</sup>

From the sociological and psychological social aspects, it is today agreed that privacy has positive functions in the development of personality. The possibility of detaching oneself from the group voluntarily makes the individual happy at the prospect of return to full activity within the group. When privacy disappears there is danger to harmony in the social interrelationships.<sup>44</sup>

Here the central question to be asked from the planner's point of view is, how is it possible to define the term "privacy"?

In a series of articles written by the sociologist Margaret Willis following a questionnaire study carried out by her,<sup>45</sup> three categories of privacy have been distinguished:

- (a) privacy within the house;
- (b) privacy in relation to other people, such as neighbors;
- (c) privacy which in its physical form is security against being watched.

Various authors have expressed the view that privacy with regard to surroundings is more important to a person than privacy in the family circle.<sup>46</sup> This has been aptly expressed by Clare Cooper as follows:<sup>47</sup> "...if a choice has to be made, the design should emphasize privacy from the outside over internal privacy."

What can also be found in literary sources is that the meaning attached to privacy and the value given to it depends apparently on the socio-economic standing. Thus, for instance, Cutler found in a study carried out by her in New York that one half of the families belonging to the low socio-economic stratum complained of the lack of privacy in comparison to 10% of members of the middle class. No person of the higher class presented a similar complaint.<sup>48</sup>

Furthermore, when requested to define the basis of privacy members of the lower socio-economic stratum mentioned as the distinguishing factor the private room to twice the extent that it was mentioned by members of the upper stratum (70% versus 34%). On the other hand, 44% of members of the upper stratum and only 8% of the lower stratum mentioned such factors as courtyard privacy, rooms that can be closed, additional bathrooms in the apartment, guest rooms in the apartment, and a domestic help not residing with the family.

In this connection it is perhaps apt to quote Chapin whose statements are brought out often in similar connections:<sup>49</sup>

"Thus privacy becomes a value. One may question the validity of imputing to others the desires, needs, and wants that are characteristic in this respect of nervously high-strung, sophisticated, and responsive intellectual persons. Perhaps the common run of home occupants is not as sensitive to deprivation of privacy as some, but it is safer to assume that some individuals born to the common run of humanity will be sensitive...Privacy is needed for thinking, reflection, reading and study, and for aesthetic enjoyment and contemplation. Intrusions on the fulfillment of personal desires need to be shut off..."

Finally, one may note in this connection that Osmond has distinguished between two basic kinds of space:<sup>50</sup>

- (a) socio-petal, which brings people together;
- (b) socio-fugal, which removes people from one another.

The consensus among behavioral scientists is that the spatial organization of the optimal dwelling unit must be such as to permit the family both interaction and privacy (and should therefore include both socio-petal and socio-fugal elements).<sup>51</sup>

As stated, also within the system of the occupant's needs there is a hierarchy of priorities which is headed by the need for shelter and security, and which ends

with the aesthetic need for which the occupant finds time when all the other needs have been met.

Thus, for instance, Clare Cooper states that the variables that foster the satisfaction of low income people with their apartments are fixed in accordance with the following, in descending order:<sup>52</sup>

- (a) internal space sufficient for family activities;
- (b) rooms and building materials facilitating easy and inexpensive maintenance;
- (c) visual and oral privacy from neighbors and passersby;
- (d) sufficient privacy within the apartment;
- (e) pleasant internal forms of the apartment;
- (f) attractive external appearance of the building which affords some individual characteristics.

The aesthetic needs are thus the last in the row.

Nevertheless, also on this subject there exists wide professional literature for the simple reason that in the affluent Western society most basic needs of the occupant are met in any case and therefore he finds time also for aesthetic needs. Add to this that the housing unit often serves the prestige needs of the middle class in the ambitious society.

Professionals agree in this matter that the external appearance of the building helps greatly in its sale. There are, nevertheless, considerable differences among people in their readiness to give up internal space for external appearance. In Britain, for instance, occupants of public housing say when asked that the appearance of the building makes no difference. The internal features of the apartment are the ones that matter.<sup>53</sup> Nevertheless, John Raven concluded from the great popularity of the houses in the bungalow style that these declarations do not reflect reality. Since buildings in this style are not particularly convenient it appears that it is not the convenience that makes them popular. Since they do not constitute dwellings of the higher stratum, it is not imitation of the higher strata but the lower ones that is the reason for this popularity. Through elimination there remains the aesthetic consideration - the external appearance of the building. People are unable to define exactly what they like and what they dislike in their building - they simply know that the building either pleases or displeases them.

The same aesthetic consideration finds expression also in the wish of the occupant to afford his dwelling as far as possible an individual character both inside and out. Thus, for instance, evidence is found in the U.S.A. that also in the working stratum and in the middle class there is a wish for such units.<sup>54</sup> Clare Cooper, for instance, argues that many of the lower stratum feel humiliated by different government departments (social security, employment bureau, also housing, etc.) and therefore they want their apartments to give the impression of identity and singularity.

There is also strong evidence from Britain which points in the same direction, namely to the wish of the occupant to live in a unit which has a personal stamp. To start with, this comes into expression in the great reluctance of the British to live in multi-story buildings. One of the assumptions is that the people are afraid that the uniformity attached to the outside appearance of the dwellings units will also affect their personality - it will enforce and force conformity on them and will compel them to be similar to one another. One of those surveyed has expressed a definite fear of regimentation.<sup>55</sup>

However, in a positive way this comes into expression in the personal stamp that the occupants give their dwelling units after having entered them. Thus, for instance, Amos Rapaport refers to the dwelling group of the Prestonpans Inchview, where standard units have been built and standard gardening plans have been supplied to the occupants. Nevertheless, each of the occupants developed his own form of garden. Not a single one of them adopted the planner's model.<sup>56</sup> The same happened to the fences in the front which also show many variations from house to house by bringing in the expression of the singular personal stamp. In places where it was not possible to vary the frontage - as in Alfred Street in this town - the personal characteristics came into expression in variations of the rear frontage of the building which faces the courtyard.<sup>57</sup>

One may bring in, in this connection, the summary by Amos Rapaport who devoted considerable thought and time to the study of this subject:<sup>58</sup>

"Much new public or private housing no longer provides these possibilities. There is complete anonymity and lack of possibility to change, adapt or personalize in both buildings and landscape, even though in other respects such housing may be admirable. Tenants are normally forbidden to paint the exterior woodwork in colours of their own choice. Projects such as Park Hill, Sheffield, deny any outside expression other than curtains, and these are lost in the vast scale of the blocks, while the entries (which seem of great importance in most houses) are completely anonymous with the doors placed side-by-side in a complete denial of any territoriality. The only remaining identification of entries is through the doormats, and even they disappear at Hyde Park, Sheffield. The new plastic panels recently introduced in housing reduce even the possibility of using windows for self-expression. In the few cases where possibilities are provided, although not intended or foreseen, advantage is taken of them - gardens and balconies are changed, frames filled with lattices and fences, and the maximum personalization possible occurs."

Exactly as Rapaport summarized this aspect for Britain, Catherine Bauer did for the U.S.A.<sup>59</sup> From studying various findings she came to the conclusion that one should avoid rigid uniformity and she pointed out that monotony is the greatest danger in any large housing project, according to her words -

"Most Americans do not want urbanity and uniformity - most of them want individuality, the sense of unique and personal qualities pertaining to each dwelling, and want the charm of historical accretion and personal craftsmanship."

In brief, the need to give a personal character to the dwelling unit, and for what is called the need to territorialize has been discussed by whole series of investigators.<sup>60</sup> The need to personalize gives this subject, in addition to the aesthetic dimension, psychological, social and cultural dimensions as well.

It does appear that the complex of basic requirements which should be met by the dwelling unit is most complicated and varied.

#### SUMMARY

In summarizing this paper on dweller's needs, housing quality and satisfaction with

the apartment, one should point out one aspect that has been brought up a few years ago by William Michelson.<sup>61</sup>

Many architects maintain that the occupants are not able to distinguish between good and bad; therefore, there is no importance and meaning to the system of their preferences and to their satisfaction. The architectural specialists are the ones that educate the public and plan for it. However, in a democratic Western society, - which of course includes Israel - ignoring the dweller's preferences harbors danger. If the built apartments are not desirable, then they are only occupied when there is no alternative and with a heavy heart. Therefore, a direct influence exists between the interrelationships of man and his built surroundings.

In brief, one may rely here on Michelson's conclusions: <sup>62</sup>

"Thus, even though a lack of wisdom may prevent people from choosing what is clearly in their own best interests, it is their preferences - and not architectural theories - that will, in the long run, influence much of what happens in the cities."

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# Decision Models for the Evaluation of Housing: A Literature Review

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The evaluation of housing plans is a complicated duty facing public officials who have to make decisions concerning public housing. The difficulty is inherent in the fact that the worth of a plan is some combined measure of its performance in the functional, technological, economic, perceptual-aesthetic and sociological contexts. Quantitative models for evaluation of housing plans are available. Some assume that a human being is capable of intuitive ordering of housing plans. The model then arrives at a consensus-given ordering of several decision makers. Two such models (3,8) are essentially voting procedures that iteratively present the decision makers with average ordering and demand regrading. Experience shows that the process converges to a consensus.

Developers of most other housing models claim that housing is so complex as to prohibit national decision making without an orderly analysis of the various elements. In France the Qualitel system (5) enables quantification of housing quality under 20 topics with grades between 1 and 5. There is no attempt to arrive at an overall evaluation. Another French model AGREMENT, implemented also in South Africa, provides quality profiles for elements of industrialized construction for purposes of standardization and public control.

There are mathematical models for optimization of housing. For example, an economic analysis of commercial high rises (6) enabled minimization of activity interaction cost and maximization of the efficient functional space on each floor. Another model (10) identified the least cost plan under constraints dictated by required relationships between spaces. Both examples were developed for optimization in the design stage without much account of user's preferences.

The evaluation of elements within isolated contexts is insufficient for systematic selection among housing plans for which it is essential to analyze the whole system and derive a measure of the overall performance. Decision makers need a decision aid that estimates dwellers satisfaction via a single quantity, because housing involves many elements, some of which are dependent, in conflict, or measured on different scales. Still, to be meaningful, it must be possible to break such quantity into partial values, each representative of the worth of a respective sub-system. Then, decision makers can use this information along with subjective impressions in the decision making process.

Evaluation of value-in-use (9) is the theoretical basis common to several housing evaluation models that have reached some degree of practical implementation. The methodology, which is basically for planning and evaluation of products, is appropriate for housing evaluation. The evaluated subject is functionally analyzed and broken down into a hierarchy of elements. Housing is evaluated by means of an additive value function. In other words, after assessing a relative importance and a quality measure for each element, the two quantities are multiplied and the products are summed, yielding an overall evaluation. The methodology is clarified

in the next section and several applications are reviewed later.

#### METHODOLOGY: VALUE-IN-USE

The Value-In-Use methodology can be presented as a sequence of three analytical steps:

a. A hierarchy of objectives is developed to break the housing subject down into its simple components. Graphically, the result is a tree of several levels, each a more detailed description of housing.

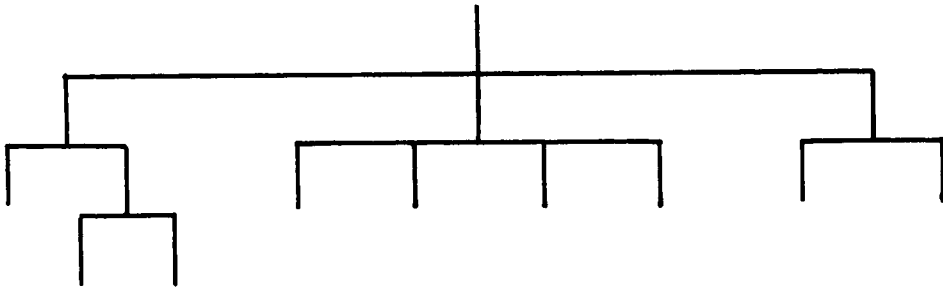


Fig. 1 A Hierarchy of Objectives

b. The objective hierarchy allows systemic weighing of housing elements. From the top of the tree, each node is considered and the relative importance of each branch is quantified so that the resulting weights sum up to 1. To determine the element's importance within the whole housing system, weights along the path leading to it from the origin are multiplied.

c. determination of a function connecting performance above the minimal with a respective level of satisfaction.

To evaluate a housing alternative, satisfaction from each element is determined and multiplied by the respective weight. Once all products are available, different summations yield evaluations of sub-systems and the whole system. If computer services are available, this sequence of calculating can be programmed within an interactive decision aid which requests and processes information about the plan into an evaluation of the sub-totals and the total worth of the plan.

The realization that models only approximate preferences and that value systems change over time dictates a continuous follow-up of the model's performance. If change is called for, there is no need to develop the evaluation system all over again - the tree system allows addition and omission of elements, as well as reassessment of some parameters.

#### FRENCH MODEL

Since 1972 the French have introduced value analysis into housing policy making. Within cost-benefit considerations the following questions have been asked: What

are the housing functions and how important is each one? What are the functional requirements associated with different quality levels? Answers to these questions are essential inputs in the derivation of a performance profile which is methodologically equivalent to value-in-use analysis.

Litaudon (7) demonstrates the application of performance profiles to the evaluation of 1000 housing units. Included in the analysis are functions external to the apartment itself. Each one is assigned a measure of quality for different levels of performance. The functions are then weighted according to averages of importance figures assigned by members of a weighting committee. The products of weights and quality measures are summed to yield total performance.

Graphically, the area under the histogram of Fig. 2 equals the total performance: The weights are denoted on the horizontal axis and the measures of functional quality on the vertical axis.

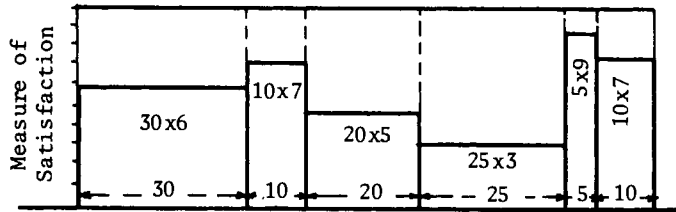


Fig. 2 Graphical Expression of the Value

The graphic display is not only illuminating, but also allows comparison of feasible solutions within a project and among plans. In particular, cost benefit comparisons are possible, if total costs can be broken into partial costs with respect to the different functions. The difficult (and sometimes impossible) task allows visual presentation of the cost profile against the performance profile (see Fig. 3) - a significant contribution to better decision making.

#### SWEDISH MODEL

In a German review of housing evaluation models (3) Swedish efforts play a major role. Three value-in-use models are described - Erikshind model, commercial buildings evaluation and hospital-staff-housing evaluation - and objective hierarchies are presented below in Figs. 4, 5 and 6 respectively. Methodologically, the only apparent difference between the models is in ranges of value functions for the elementary factors (0 to 10 vs. 70 to 90). But, Fig. 7 makes it clear that it is mainly a question of scaling, and the grading of alternatives should not be affected. Despite the methodological equivalence the models are not equal.

Cost and benefit aspects were included in the Erikshund model for the evaluation

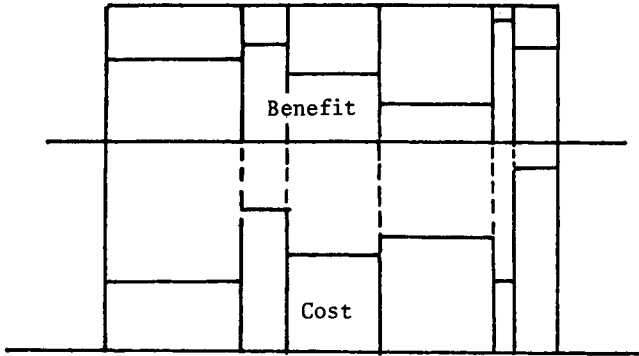


Fig. 3 Cost & Benefit Analysis

of single family housing. Aspects like duration of construction, flexibility of the plan and many quality considerations were left out. Also, the elements at the bottom of the objective tree (Fig. 4) were evaluated in a most general manner, without account for basic characteristics, such as natural lighting and finish standards, this leaving room for arbitrariness. The model was tested by evaluating a collection of plans. The intuitive dominance of one plan was obvious and the model was expected to confirm it, but mainly to help ordering the other plans. Once the plans were assigned values by the model, sensitivity studies were made. For shifts of the parameters within reasonable ranges only the dominant plan did not shift position in the ordering. Thus, the Erikshund model was not as sensitive a reflection of user's needs and not as robust and stable as it should have been for practical implementation. Still the Erikshund model is clear, logical and systematic, and is a significant contribution towards development of better models.

In the evaluation of housing it is possible to separate quantifiable elements from others. In another (unimplemented) Swedish model (Fig. 5) the two types of variables were treated differently:

1. Rejection of a plan if one of the non-quantifiable elements does not meet minimal requirements.
2. Quantitative evaluation of quantifiable elements, unless rejection of the plan is warranted because minimal requirements are not met.
3. Cost analysis.

Two groups participate in the evaluation. One, composed of the contractor and the engineers, is responsible for Steps 1, 3 and technical elements of Step 2. Users participate in the other group and evaluate functional and environmental criteria

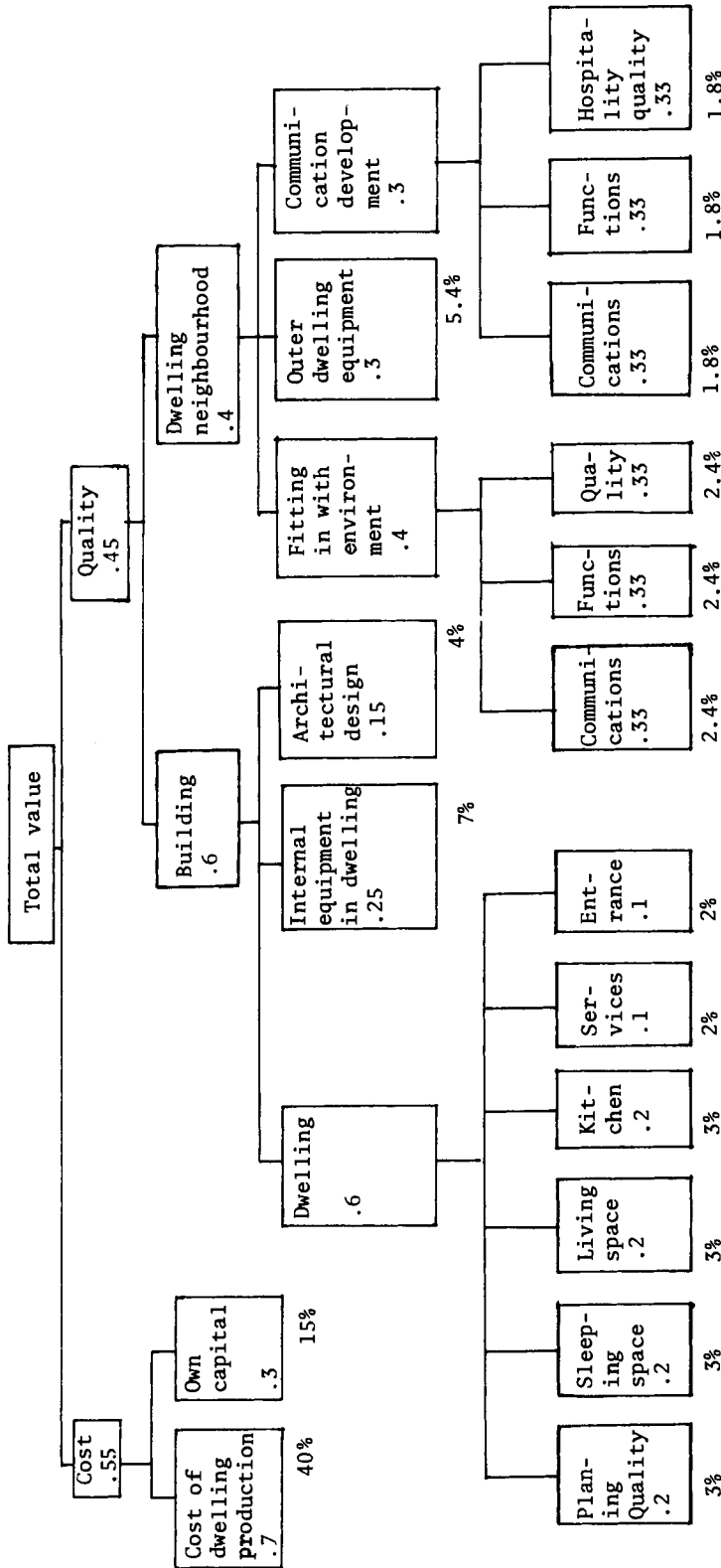


FIG. 4: ERKISLUN METHOD

In every rectangle is stated its measure of significance in the breakdown by means of a decimal fraction. At the bottom of the final rectangles serving as criterial for evaluation is stated the percentage of their-significance within the whole system.

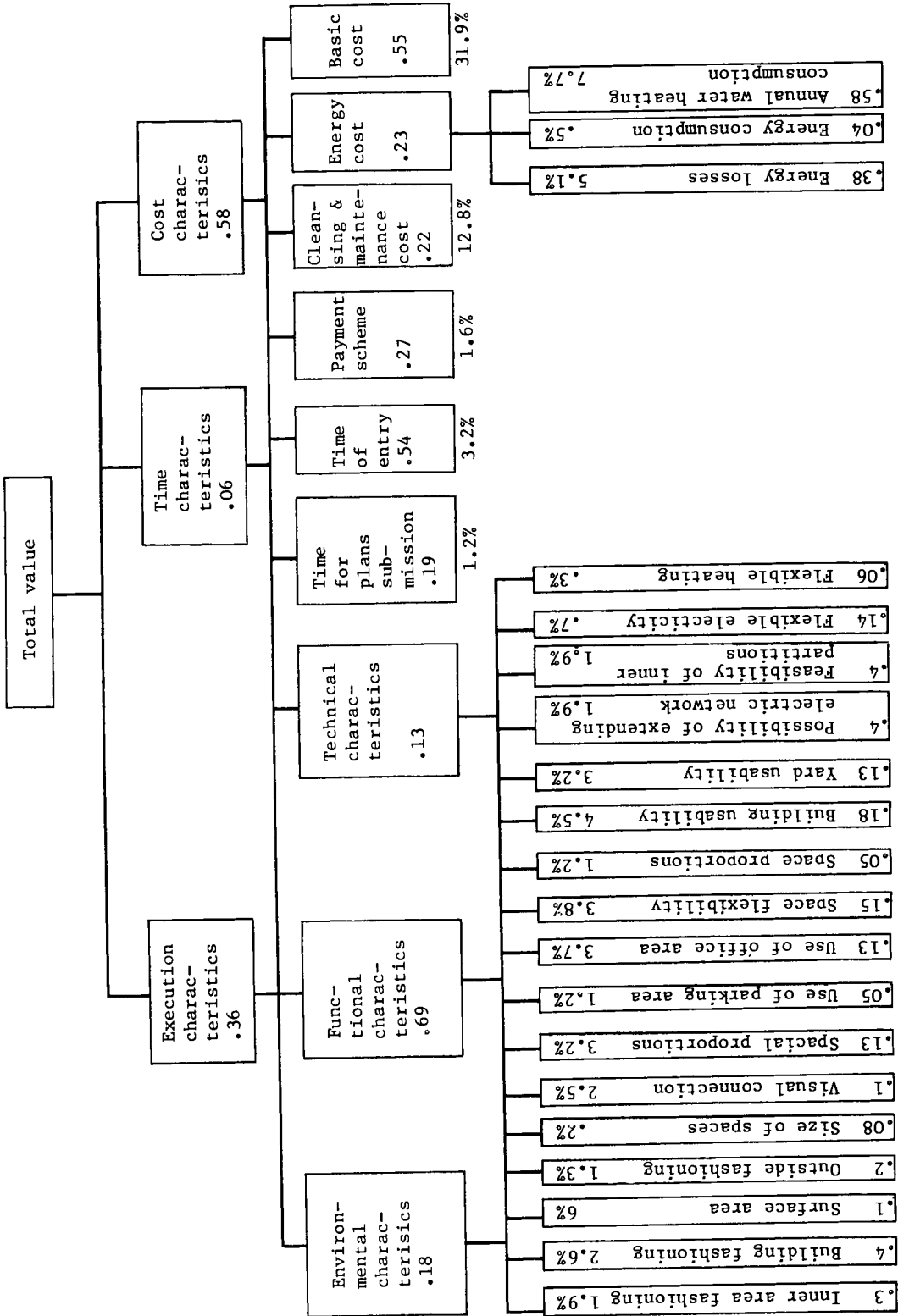


FIG. 5: EVALUATION OF MANAGEMENT BUILDINGS



of Step 2.

Figure 6 is a segment of an objective hierarchy of 50 elements (for the evaluation of 200 housing units planned for hospital staff) covering the duration of construction, costs and functional quality. Weights were not prefixed. As indicated in Fig. 5, some were assigned ranges, so that the contractor could determine the weights so as to stress advantages of a plan. An evaluation group, composed of policy makers, prospective users and advisers, was in charge of evaluating qualitative variables by means of a discussion, unless it was possible to state in advance definite guidelines for evaluation on the basis of accumulated experience. These less subjective variables were evaluated along with quantitative variables by means of value functions.

The Swedish multiple experience sheds light on the following:

- An evaluation tool is effective in planning and design.
- Norms can be pre-defined.
- Preassignment of weights is necessary to achieve uniformity in evaluation.
- Development of value functions with common range contributes to uniformity as well as ease of implementation.
- Analysis of absolute costs is preferred to comparative evaluation because of the magnitude of investments.
- A plan can be associated with cost and benefit measures which have been separately analyzed.

#### GERMAN MODELS

Germany joined the list of European countries involved in the evaluation of housing in recent years. Much work was devoted to definition of performance specifications, but there were a few attempts to proceed to an overall evaluation. Following a review of Swedish evaluation models (3) Burchard presented his own experience with housing evaluation which resulted in a three-step procedure with respect to a proposed plan:

1. Test of minimal requirements (according to the law) and rejection if at least one is not met.
2. Cost analysis
3. Benefit analysis.

The best plan is determined according to cost-benefit considerations (land, development, construction, equipment, additions, etc.) and future costs (water, sewerage, light, fuel, garbage disposal, building and street maintenance, insurance and preservation of the property). The purpose was to be able to check whether increased immediate investment (e.g., in better insulation) is worthwhile (in terms of future savings in cooling and heating costs).

The benefit analysis separated quantifiable factors (Fig. 8) from non-quantifiable ones (Fig. 9). The quantifiable elements were associated with value functions over performance between minimal requirement (prescribed by law) and border requirements (officially recommended). The infeasibility of value functions for qualitative variables leads to evaluation by subjective consensus of an evaluation committee for verbal description of performance between minimal and border requirements. In

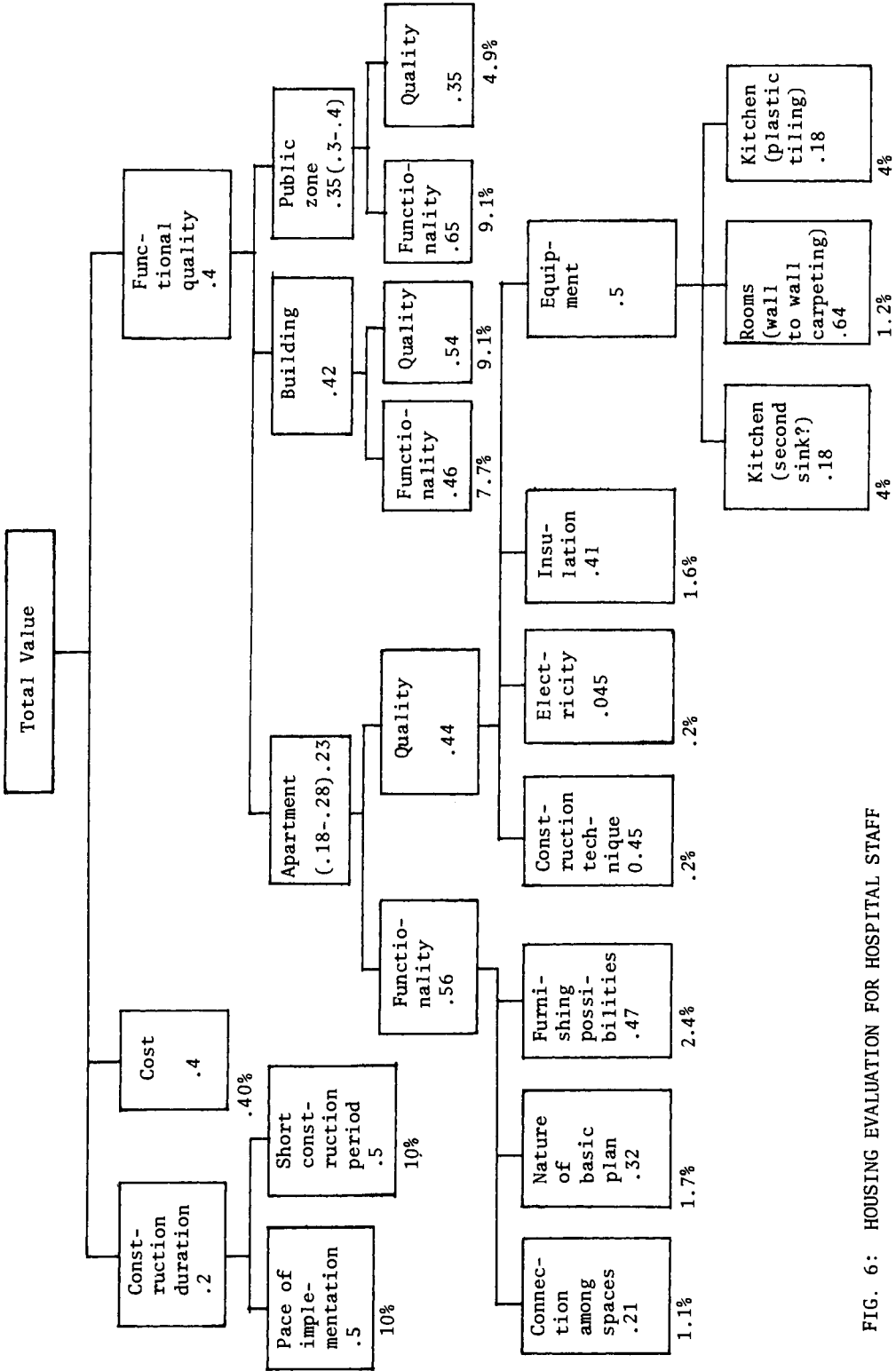


FIG. 6: HOUSING EVALUATION FOR HOSPITAL STAFF

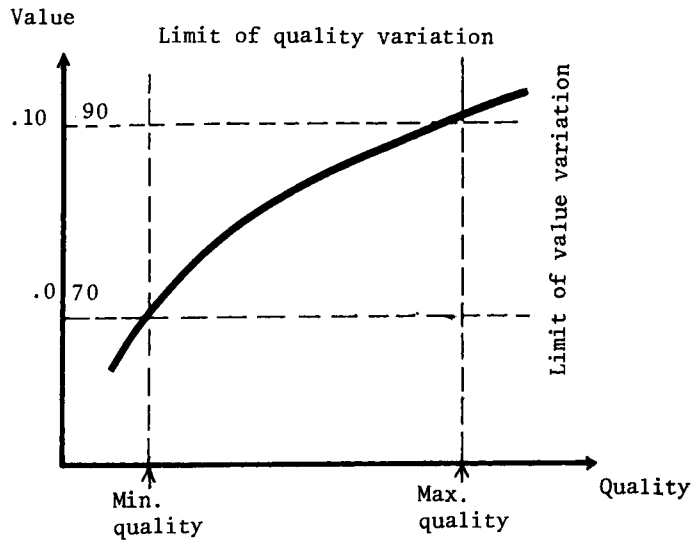


FIG. 7: VALUE FUNCTION

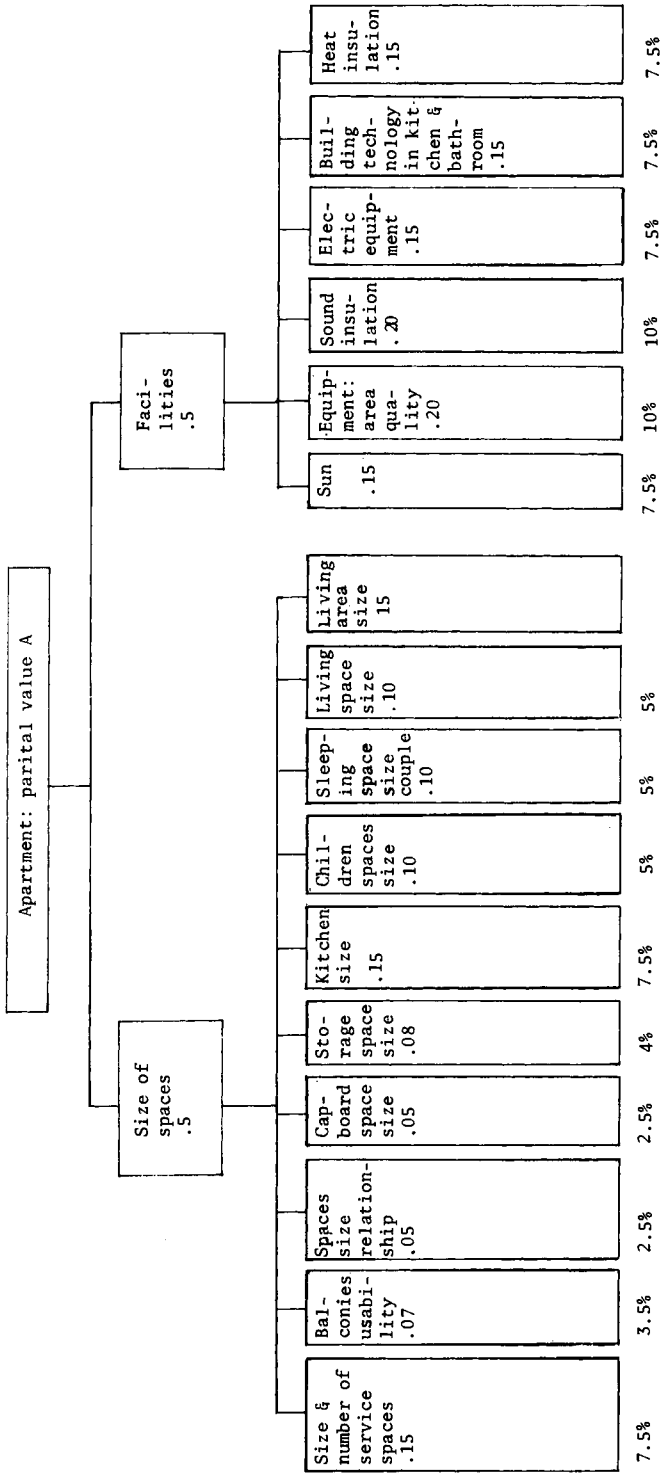


FIG. 8: PURPOSES HIERARCHY FOR QUANTITATIVE FACTORS

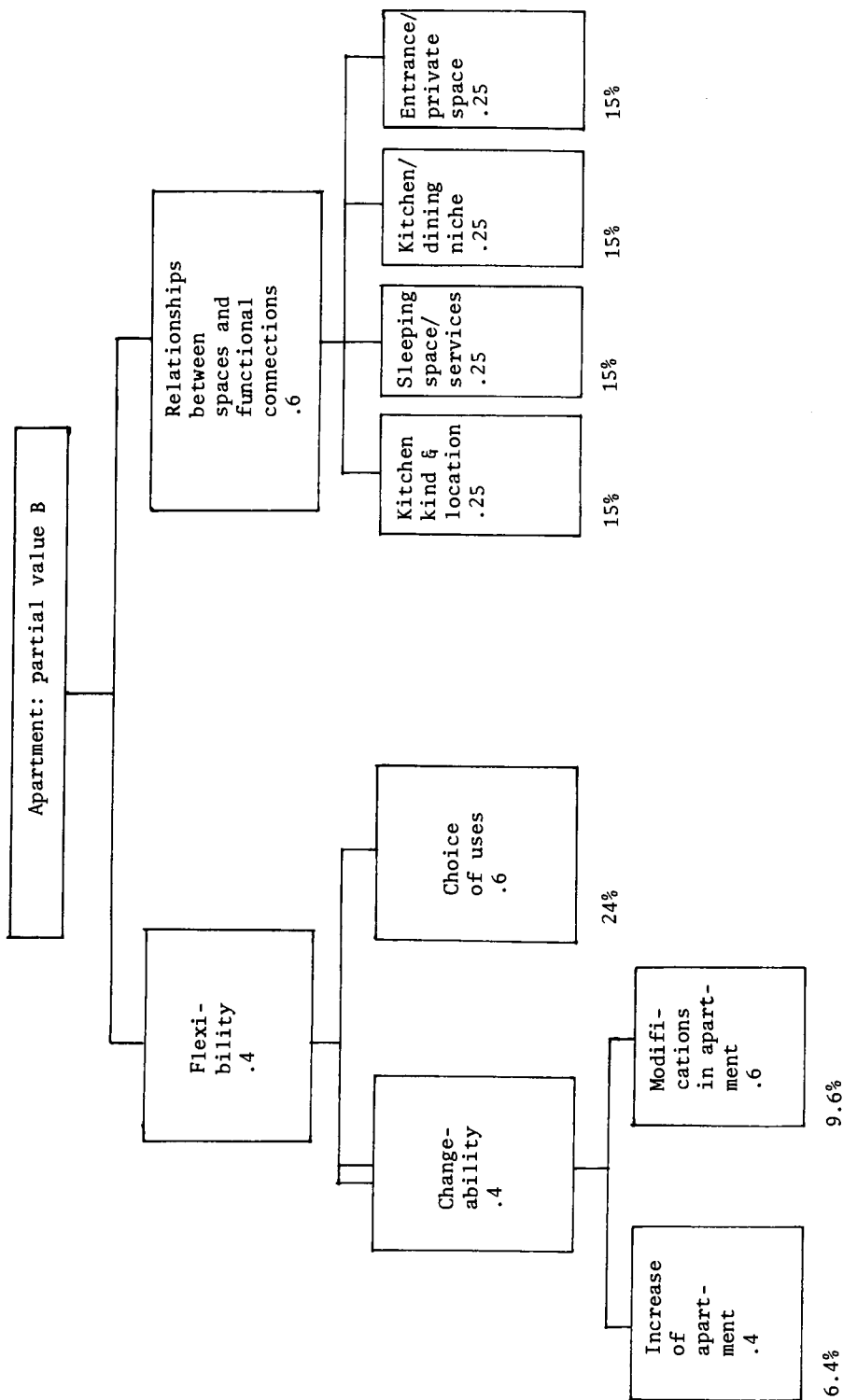


FIG. 9: PURPOSES HIERARCHY FOR QUALITATIVE FACTORS

both cases a value between 70 and 90 was assigned, with 90 to 200 points reserved for exceptional solutions. Weights along the objective hierarchy allowed the collapse of values for the different elements to single measures for the quantifiable and to qualitative aspects. From the report, it is unclear how exactly these, along with the present value of the costs, serve the decision maker.

Burchard, the author, is aware of the cost associated with the analysis itself and finds it justified because of the possible optimizing housing quality at different cost levels. While admitting the subjectivity of the analysis, he sees a considerable advantage in the ability to experiment with the model and to improve and update through feedback.

In an attempt to reduce the subjectivity of the weights, another German group (11) used the following assessment procedure: Minimal and maximal quality levels were associated with each element; minimal according to the law, maximal - where no investment above that quality is worthwhile. In an economic environment, a cost must be associated with a shift from minimal to maximal quality. This extra cost  $D$  is a measure of importance of the element in question. If  $\sum D_j$  is the sum of extra costs over branches (j) at a certain fork of the bottom level, then  $D_i / \sum D_j$  is the relative importance of element  $i$  within the fork. Each fork at the bottom level emanates from a branch at the next-to-the-bottom level. That branch is associated with the sum of extra costs  $\sum D_j$  of the respective fork. That branch also belongs to a fork, and again it is possible to calculate relative importance figures. This process proceeds iteratively to higher levels until each branch, from top to bottom of the tree, is assigned an objective weight.

The developers of this weighting scheme realized that the objective weights do not necessarily meet user's expectations, especially since exact determination of costs associated with each element is not trivial. The objective weights were, therefore, subjected to an iterative subjective adjustment process. Policy makers and housing experts first review the top level weights and suggest alterations so as to better reflect user's needs and preferences. A simple computation is then done so as to have the weights at the top. Next, the experts consider these adjusted weights at the second level and apply their judgement to alter if necessary. The weights at the next level are consistently adjusted and the process is repeated until the bottom level is covered.

In this German evaluation scheme each plan was graded twice: - by the contractor as part of the submitted proposal, and by an objective review committee. The decision makers, presented with both evaluations, were exposed to the contractor's point of view and could apply honest and objective judgement. This, coupled with the fact that the contractor could review the report of the decision makers, resulted in an open and trustworthy system, conducive of fair competition.

This German model (11) also, differs from other models by its approach to minimal requirements. Plans that do not meet minimal requirements are not automatically rejected. Rather, penalties are associated with unmet norms and added to the total cost of the plan, thus making it less attractive.

#### THE SWISS MODEL

An evaluation model developed in Switzerland (WBS) is probably the most thorough and successful attempt at housing evaluation to date. Some of the obstacles encountered by other models have been removed and the model has reached actual implementation. A benefit measure is derived from the model so as to guide allocation

of government support among competing plans. Cost is incorporated into the decision making process via a benefit-cost analysis. The table contains for 3 levels of quality acceptable cost levels according to family size. Designers are expected to propose plans that meet these cost-benefit guidelines.

The first three levels of the objective hierarchy behind WBS are drawn in Fig. 10. Three major aspects are considered: apartment, close vicinity and neighbourhood supply. The structure is far too complex for this review (270 end points) and therefore only a complete hierarchy for the apartment is brought (Fig. 11).

Weight assignment was done by a committee of seven members, carefully selected so as to be representative of a variety of ages, family structures, housing forms, locations, and socio-economic backgrounds. Each member had to exhibit familiarity with user's needs, variations in user's behaviour and housing habits, future housing objectives, and model methodology. Each was expected to suppress individual preferences.

The Swiss group realized that the evaluation task would be time consuming and even infeasible, unless the number of elements is reduced down from 270.

The wide variance among the 270 weights of the individual elements allowed exclusion of the negligibly weighted. Also excluded were futuristic elements which are not likely to appear at present, and elements for which performance specifications cannot be confirmed at the planning stage. The latter were only checked for minimal requirements without further evaluation. Another reducing form was the union of several factors into one exclusive of all (e.g., a shopping center that covers food shopping, laundry, a bank, etc.). Thus, out of 270 objective factors, only 75 were left as evaluation factors.

Value functions were developed for each evaluation element. Performance between the worst, but not below minimal requirements, and the best, within a domain deserving public support, was transformed into a value range between 0 to 4. Continuous quantitative elements were assigned linear functions (without seriously affecting the model). Three performance levels for qualitative variables were verbally defined so as to function values of 0 (low quality) 2 (medium) and 4 (high).

To insure reliability and validity WBS had been carefully tested throughout its development. Sensitivity studies attested the robustness of the model: there were only insignificant effects to reasonable shifts in the parameters. The model proved to be a reflection of user's preferences. Its simulated evaluation of 31 populated projects was in agreement with residents' attitudes. Model testing is also pursued in the period of more than 2 years since WBS went into actual use, by a follow-up body, a consulting group that was not involved in the model's development. A report of the first 18 months positively summarizes successful experience. It also points out ways of further improvement through updating the model's structure (addition of evaluation elements) and parameters.

The follow-ups confirms that WBS is a practical evaluation tool. It takes a half working day of a public official, presented with a proposed plan, to fill up the evaluation forms. He is equipped with an evaluation manual containing pertinent model information. The evaluation starts by insuring that minimal requirements (as listed in the manual) are met. Then, each element is graded by reference to the value functions listed in the manual. Evaluation forms, listing elements and the weights are designed so as to be filled by these grades and their multiplications by the respective weights. These products are summed to yield information pertinent for evaluation and decision making.

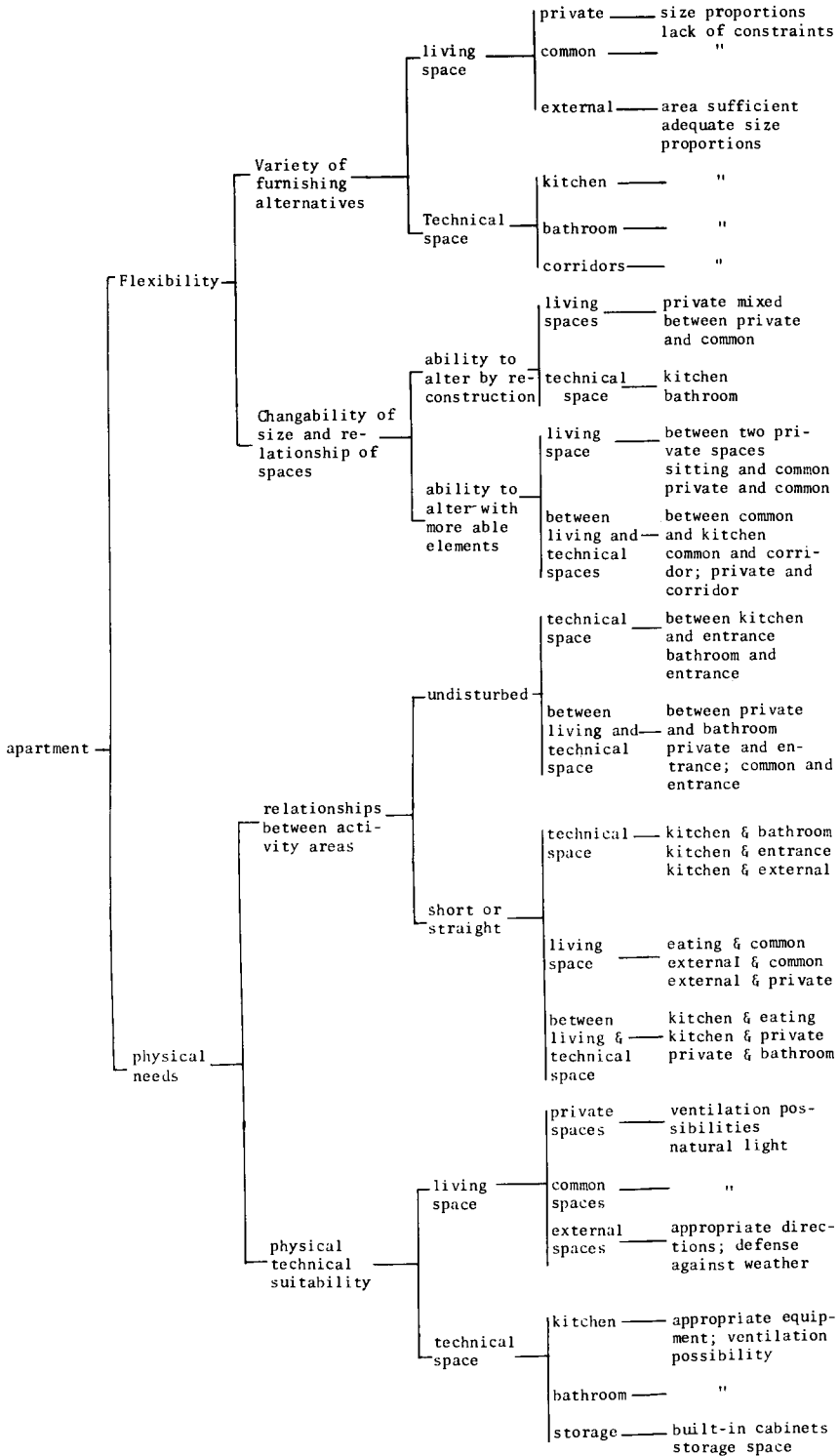


Fig. 10 Hierarchy of Purposes



### CONCLUSION

An evaluation system is no substitute for policy makers. Although it aids decision making, there is still room for personal judgement. Decision makers must exercise judgement in weighing the model's estimates of benefit along with other benefits (not covered by the model) against costs. Experience with decision models shows that these tools actually contribute to saving and improvement in housing by exposing policy makers to useful cost-benefit information.

An evaluation tool is bound to meet with opposition among architects, especially if it is viewed by them as a black box replacing the decision maker. Experience shows that once architects are made aware of the structure of the model, and the parameters behind it, they not only accept it, but plan accordingly. They can use the tree structure as a checklist in the process of planning. Not only can they make sure that minimal requirements are met, but they plan so as to satisfy as much as possible heavy weight elements. Thus, apart from the evaluation capacity, the model's educational potential is of value in executing housing policy dictated by users' preferences.

Motivation for an evaluation model should result from realization of the arbitrariness, subjectivity and bias of intuitive evaluation. These deficiencies are reduced if the evaluation is spread over many elements covering functional, technological, economic, aesthetic and sociological aspects. Thus, the proposed evaluation (via elementary components) should raise the quality of decision-making.

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# Home Ownership, the Rental Market and the Cost of Housing

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## INTRODUCTION

The share of the free rental market in supplying housing services in Israel is extremely small relatively to other countries. Only 6 percent of the households use this tiny market to purchase their housing services, while a share of 25-50 percent characterizes most of the developed countries.<sup>1</sup>

It is almost commonly believed in Israel that the absence of a large free rental market is responsible for the grave housing problems young couples and other new entrants to the housing market face in recent years. Recently, various programs have been developed in order to reconstruct the rental market. The subject of this paper is to analyze three basic questions pertinent to this new trend in the Israeli housing policy:

- (a) What is the explanation for the decline of the free rental market?
- (b) Can the existence of a large free rental market contribute to alleviating the burden of increasing housing services' cost?
- (c) What is the appropriate way to enhance the reestablishment of the free rental market if it deserves being encouraged?

Though the analysis refers to the new trend in the housing policy in Israel, it is applicable to other countries as well. As will be explained later, the decline of the free rental market is not confined to Israel only. Rather, this is a long run trend which characterizes other countries as well, since its underlying economic forces are common to most of the developed countries with only a few exceptions.

## THE DECLINE OF THE RENTAL MARKET AND ITS CAUSE

Before the second World War most of the dwelling units in the urban Jewish community of Palestine were owned by landlords who rented them out in the free rental market. This market disappeared at the beginning of the war, when rent control was imposed. The market has never recovered since then, though rent control on newly constructed dwelling units was gradually abolished in the sixties. The additional population preferred to own its dwelling units. In 1957 almost 54 percent of the households already owned their homes. This percentage increased steadily and reached 61 percent in 1974.

As asserted before, this trend characterizes other countries as well. For instance, the share of home ownership in the United States increased between 1890 and 1956 from 37 percent to 59 percent<sup>2</sup> and reached 63 percent in 1970.<sup>3</sup>

The common explanation to this long run trend is the discrimination against the rental market which is inherent in the taxation system and especially the income tax laws.<sup>4</sup> This discrimination results from the fact that no income tax is imposed on imputed income which is realized by home-owners. In order to illustrate the nature of this discrimination consider, for instance, two individuals, Peter and John. Suppose that both earn the same wage and possess the same amount of accumulated savings. Assume that Peter uses his savings to buy a dwelling unit where he lives, while John invests his saving in profitable assets like securities. Suppose also that John's income from these securities in the form of interest, dividends etc. is just sufficient to pay for the cost of a rental dwelling unit of the same size and quality as Peter owns.

Before the tax authorities interfere no one is better off than the other. Both afford the same consumption bundle and therefore the same standard of living. This equality is not maintained after the imposition of tax on earned income. Since John has to pay income tax not only on his wage but also on his income of interest, dividends, et., he cannot afford to enjoy simultaneously the same housing services and consumption of other goods as Peter does. In order to avoid this reduction in his standard of living he will tend to follow Peter and buy a home of his own.

It is clear, therefore, that the prevailing income tax provisions are horizontally inequitable: equals are unequally treated. Moreover, the benefit of home-owners increases with income because of progressive taxation rates.<sup>5</sup>

Another source of discrimination inherent in the tax system in Israel is related to capital gains. This discrimination has been intensified since 1975 when the tax reform became effective. According to the new capital gains tax provisions, home-owners are not liable to this tax, with the exception of extremely expensive dwelling units. In contrast to this provision, real capital gains realized by a landlord who sells housing services in the free market are incorporated into his taxable income (income tax rates are applied to capital gains after being deflated by the general C.O.L. index. The nominal capital gains are taxed at a rate of 10 percent only).

Home ownership is also favored by the preferential treatment of long-term credit and mortgage institutions; subsidized credit which is available for purchasing a dwelling unit for self residence is not available to potential landlords.<sup>6</sup>

It is sometimes asserted that the tendency to prefer home ownership is motivated by speculative considerations. This is not correct. The expectations regarding future increases in real properties induce perhaps households to invest in real estate but not necessarily to live in their own home.<sup>7</sup>

To sum up: the rental market is discriminated against by the tax system and long-term credit arrangements. This discrimination can explain the long-run trend of the decline in the rental market.

#### THE ADVANTAGES AND DISADVANTAGES OF THE RENTAL MARKET

So far I discussed the disadvantages of the rental market from the viewpoint of the housing consumer due to the institutional interference. Now I turn to considerations of the economy as a whole. Two main advantages are attributed to the very existence of a large rental market:

- (a) The rental market contributes to the reduction of housing costs of these households for whom the capital market is inaccessible.

(b) The rental market allows inexpensive spatial mobility, contributing thus to the overall economic efficiency.

(a) In order to illustrate the first advantage it is necessary to describe, at least briefly, the source of the high cost of housing in Israel. Between 1959 and 1975 the C.O.L. index increased at an average annual rate of 10.9 percent. The prices of dwelling units increased by 5.5 percent which exceeds the annual rate of increase in real disposable income. It is estimated that in 1975 the value of a standard one bedroom apartment was 7.4 times the annual income of the median urban wage earner. Moreover, the free mortgage market is tiny and the credit terms, even in the controlled and subsidized market, are tough. First, the duration of the loan is relatively short (10-15 years). Second, the mortgage covers in general less than 50 percent of the value of the dwelling unit. Thus, even those households who are eligible for the subsidized mortgage cannot afford to redeem the annual payments for interest and capital, especially during the first years. The system forces young couples to save heavily during the first years after marriage instead of enabling them to spread their savings during their life cycle according to their preference.

The advantage of a large rental market is twofold. First, the newly formed households can separate their housing consumption considerations from their saving plans. In the case of a rental market, the rent equals the interest rate plus amortization of the capital for 50 years or more. In the case of home ownership, the household is forced to recover the amortization costs after 10-15 years or even earlier. Second, the landlord, once organized as a firm, is more accessible to the capital market and therefore can mobilize capital at a lower cost. This advantage is real in economic terms. The "forced" high rate of saving of the family after the purchase of the dwelling unit is an expensive way to raise capital from the social point of view, in comparison to that of raising capital in the free market.

It is sometimes argued that this benefit of the rental market is offset by the higher maintenance cost relatively to homeownership. The reason, it is asserted, is that the tenant does not care about a property he does not own. But this should not be true in general, since a firm maintaining many dwelling units can benefit from economies of scale and specialization. It is not clear, therefore, whether, on the balance, homeownership is associated with lower maintenance costs in comparison to the rental market.

(b) Inspecting the source of the high moving costs associated with home ownership, one should distinguish those items which do not constitute real economic costs inherent in this market structure. Some of these costs result from institutional interference and imperfection of the market for services required for mobility. For example, 3-5 percent of the value of the newly purchased houses is paid as taxes and therefore is not real economic cost. A similar argument can be raised against legal fees which are not competitively determined in Israel. Thus, the development of the rental market is not indispensable for enhancing mobility. Rather, these institutional interferences and the market imperfections should be abolished.

But there is one real advantage regarding moving costs which is inherent in the rental market per-se: this advantage is related to the costs of search. In order to illustrate this advantage, assume that for a given amount of search it is expected that on the average the transaction will be 5 percent more expensive than what it would have been had all the market been searched (in this case the best price can be discovered). In the case of renting, this is 5 percent of the annual rent. If the annual rent is 20 percent of income, the cost of the error is 1 percent of the annual income ( $20\% \times 5\%$ ). In the case of home-ownership the cost of error

is 30 percent of the annual income, if we assume that the price of houses is 6 times the annual income (600% x 5%). It is clear, therefore, that more real resources are devoted to search in the case of home-ownership in order to prevent the higher cost of error.

To sum up: the very existence of the rental market is desirable. It can alleviate the financial burden of the housing consumer and is conducive to mobility and economic efficiency. The pertinent question is what is the appropriate way to encourage the reconstruction of the market.

#### RECONSTRUCTION OF THE RENTAL MARKET

Most of the existing programs designed to promote new construction for rental market are based on both overt and concealed subsidies to factors of production. The rental market to be enhanced by these subsidies is not designed to be really competitive, but rather controlled by the ministry of housing. It is believed that the entrepreneurs will earn "adequate" profits and the tenants will pay "reasonable" rents. But high profits are consistent with low rent only if the government will subsidize the programs heavily. And indeed, analyzing the financial aspect of the programs ends up with the conclusion that they are the most expensive. Besides their distortive character due to subsidies to factors of production, they refer to new construction for the rental market. The existing stock is not included. This is of course unreasonable, since it does not matter whether the existing or the newly constructed units will be shifted to the rental market.

In view of the analysis of section 2 above it is natural to infer that the best way to enhance the development of the rental market is to abolish the existing discrimination against it. First, the discrimination against the rental market inherent in the tax system should be stopped. The best way to do this is to impose income tax on imputed rent. But if this is not feasible<sup>8</sup> there are at least two alternative arrangements. One is not to tax income from rent. The second is to allow deduction of rent payment from taxable income.

In order to bring the rental market to equal terms with home ownership, it is also necessary to abolish the discrimination inherent in the capital gains tax provisions. Either the capital gains should be imposed on home-owners too or no capital gains tax should be imposed on dwelling units at all, whether occupied by their owners or by tenants.

Second, the preferential terms of mortgage to home-owners as part of subsidizing low-income households should be stopped. Instead, a household eligible for support will be entitled to housing vouchers. These vouchers will be used to either repay the mortgage if the household prefers to purchase his home, or to pay the rent if the household prefers to live in a rented dwelling unit.

Once the discrimination against the rental market is abolished, the demand and supply in the free market will indicate whether economically it is desirable to extend the market and by how much. Moreover, these same forces will determine whether this extension should be carried out by new construction or from the existing stock. The change in demand for the rental market will reflect its economic advantage which has so far been offset by institutional intervention.

#### FOOTNOTES

1. See United Nations, Statistical Yearbook, 1974, pp. 786-819.

2. Richard Good, "Imputed Rent of Owner-Occupied Dwellings under the Income Tax", Journal of Finance, December 1960.
3. U.N. Statistical Yearbook, op. cit.
4. See for example John P. Shelton, "The Cost of Renting versus Owning a Home", Land Economics, February 1967, pp. 59-72.
5. The discrimination is more severe in the U.S. than in Israel where no tax shelter is allowed (i.e., in contrast to the U.S., in Israel home owners cannot deduct property tax and interest on mortgage from their taxable income).
6. Indeed, there is no control on the use of the apartment after being purchased. But according to this credit arrangement, a specializing landlord who owns more than one unit is deprived of long-term capital which is available to potential home owners.
7. See Shelton, op. cit.
8. Some economists suggest that each home-owner be required to submit self assessment of the imputed income. However, this assessment will be an offer to potential renters, i.e., each potential renter will be entitled to rent the dwelling unit at the rent declared by the home owner...

## Introductory Note

The feeling that gives the citizen pride in his town is discussed by Arch. Ram Carmi in his paper on "Human Factors in Neighborhood Planning". This feeling, the author finds, is regrettably lacking in the suburbs and towns we have built in Israel in the past twenty-five years.

In the great building efforts made to meet housing needs, one component appears to have been overlooked - the component around which Israel came into existence: the establishment of a "National Home". The term "home" has not been sufficiently well understood and has unawares been turned into "housing solutions".

"Home" means more than just one's apartment: it also implies a sense of belonging to the surroundings, to the neighborhood, to the people who live next door; it is a sum total of the physical and social components that form the flesh and bones of the built up area.

By adopting the principle of "zoning", our builders have split up the urban space into isolated parcels of housing, work, leisure and transportation and have thus deprived our new towns of the sparkling urban life in which all experiences are mingled in orchestrated activities, as can be seen in historically developed towns, including Old Jerusalem.

What makes a given project become a place that teems with life, imbues it with the magic that breathes life in one place and not in another, is something we do not yet fully understand. We must, however, try and plan places where we can strike root in this country, and may hope to do so by incorporating traditional Mediterranean architectural values in contemporary architecture, adapted to the human scale.

The quality of life in an urban environment dealt with in Mr. Carmi's paper from the psychological and architectural aspects, is approached from a different angle by Dr. Shimeon Amir in his paper entitled "New Attitudes for Social Indices in the Evaluation of Quality of Life". Dr. Amir considers the normative and organizational provisions that have to be made by society in the evaluation of the "quality of life" and the determination of social indicators in the physical planning of a new neighborhood in a big city. The author poses in this connection a number of questions relating to the allocation of grounds for recreation, to the need for changing population patterns and to restrictions on the building of new units in excess of certain standards. The various professional groups - the author asserts - will have to make adjustments to include new indices in the exercise of their functions.

Even before agreeing on the social indices, every society will have to determine its policy within four basic value areas. These include norms for minimum income to meet "quality of life" needs; maximum income as a ceiling to the resources that can be used by an individual, without aggravating the society's concern with inequality; the scope of diversity - freedom of the individual to make his choice



among available goods and services; the scope of organization - limitations in the exercise of freedom, necessary for the basic organization of society.

Dr. Amir concludes his paper by saying that these considerations of quantitative and qualitative criteria of "quality of life" would, in the future, certainly affect the policy-makers at various levels and in various sectors.

The problem of how these and other criteria should be arrived at in urban planning, is taken up in the paper by Prof. Chester Rapkin on "Recent Developments in Community - Participation in Urban Planning in the United States".

Urban planning - Prof. Rapkin finds - has recently become much more comprehensive than before, adding to its basic concern with the built environment also economic, political and social policies. Urban planning has been brought closer to the interests of the general public, particularly the poor and the minorities, who have become more politicized as a result of civil rights movements and other developments. The role of the planner has become converted from that of an expert whose decisions are final to that of a formulator of alternatives. He leaves urban policy to emerge from the interplay of interests that interact on the political arena.

The Federal law in the U.S.A. now requires citizen involvement in local planning. Also voluntary community organizations aid the Government to formulate public policy.

Advocacy planning, long associated with activism by young and liberal professionals on the part of the poor and powerless, has entered a new phase, and is now viewed as an accepted technique of presenting the case for the local community.

This recent development places a strain on the governmental process because advocacy is insistent and demanding, while the municipal officials must be conciliatory, multi-lateral, compromising and calm. Reconciling these two diverse postures will be a real test of democracy on the urban level.

A specific aspect of the urban planning policy referred to by Prof. Rapkin, that of residential density, is taken up by Dr. Eli Borukhov in his paper on "Density, Welfare and the Trade-off Between Different Objectives".

Residential density or the number of dwellings per unit area - the author states - affects the quality of life in urban environments in both direct and indirect ways. Higher densities may result in less pleasant housing conditions, but may, on the other hand, lead to significant savings in the cost of housing development. It may also increase the available choice of shops and services within a given radius. Determining the optimal level of density will depend on a trade-off between the relevant factors and influences, and should depend on the preferences of potential residents and on their financial resources.

The aim of good planning is to find the characteristics that will give the maximum level of satisfaction to the residents, subject to their budget limitations. Density standards should therefore constitute a compromise between the various attributes and shortcomings of the environment.

People probably do not perceive the gross density, but are influenced by variables such as free space between buildings, extent of building coverage and the like. If this is so, then modifications of these variables, while keeping the density levels constant, gain greatly in interest. The aim of good planning is to match as closely as possible the preferences of the prospective inhabitants. To do so, it is necessary to arrive at quantitative estimates of the residents' relative

evaluation of these attributes, or their trade-offs among the various characteristics including the possible savings in costs.

Dr. Borukhov concludes his paper by citing the results of several studies undertaken on this subject.

A more budget-oriented view on residential density is presented in the paper by Michael Boneh on "Residential Density in Urban Planning". The author reports in his paper on a study carried out for the Israel Ministry of Housing, aimed at providing guidelines for planning from the aspect of net residential densities.

A basic assumption adopted in the study was that such densities should be the result of values and costs. Social and psychological aspects were considered only as far as their possible qualification and influence on densities.

For the evaluation of qualities influencing net densities in residential areas, a concise model was elaborated, based on normative sizes of dwellings, open areas and free spaces between buildings. From a comparison of relative costs and benefits, a number of conclusions was reached.

One conclusion is that within the range of 8 to 20 dwellings per dunam (1000 sq.m.) net, the lower densities show higher qualities at a relatively small increase in costs.

In maintaining a similar range of environmental qualities, 8 to 12 storey buildings have almost no advantage, in net density terms, on 4-storey buildings. Some improved environmental conditions offered by them are outweighed by social and psychological disadvantages.

Another conclusion is that, to permit measurement of costs and values, schemes should include information on the number of families and their size; built-up area and number of floors in buildings, space between buildings, and open space on the ground for parking and recreation.

The suggested guidelines indicate the various factors that influence the environmental conditions in the dwellings and their surroundings, but leave these considerations to the individual architect, while providing only the framework within which his creative activity is limited.

The discussion on the environmental spaces of a housing scheme is narrowed down to those of the individual apartment in the paper by Prof. Gilbert Herbert on the subject of "Designing for Human Behavior: Some Performance Guidelines for the Design and Evaluation of Environmental Spaces in the Dwelling". This study is concerned with performance guidelines from the point of view of the user, for the design and evaluation of environmental spaces within the individual dwelling. The point of departure is behavioural, based on an analysis of activities in the home, and the guidelines are intended to aid the designer, though the creative synthetic act remains his.

Performance requirements for activity zones in the dwelling include spatial requirements, storage requirements, privacy controls, technical requirements and environmental conditions. These are examined in connection with the adaptability of the dwelling to alternate life styles, and especially to the different dwelling preferences which these life styles generate.

The author's immediate purpose is to define environmental conditions for activity zones so that they will be supportive environments for human behaviour; and to

establish organizational principles and procedures for combining zones into functional spaces, and for connecting these spaces into generic plans and dynamic systems. In the task of creating the concrete reality of architecture, these performance guidelines are a tool, an aid to design and a method of assessment and evaluation. They are not a substitute for the architect's creative talent and professional skill.

It is the philosophy of this approach that dwellings must be responsive to the needs and desires, the reasonable aspirations and the realizable dreams of the user.

# Human Values in Urban Architecture

Ram Carmi

*Ministry of Housing, Israel*

We always live under the pressure of a shortage of housing. Of schools, of hospitals, of universities. We make every effort to build as much as our budget will let us. We do our best to raise the standard of building, to solve social problems. Still, I feel that in all those efforts there is a lack of one component, the component around which Israel came into existence: the establishment of a "national home". The meanings and qualities inherent in the term "home" are not sufficiently understood and therefore are not reflected in the efforts we invest in solving the urgent problems of the day. The "home" which the visionaries of our statehood had in mind has, unawares, turned into "housing solutions".

"Home" means more than just the narrow confines of one's apartment; it also implies a sense of belonging to the immediate surroundings, to the neighborhood in which we were born, to the people who live next door, to the places where we grew up, went to school and played. "Home" is the sum total of all the physical and social components that form the flesh and bones of the built-up area; and the relation between those components provides the background that permits the satisfaction of our desires, and contributes to the residents' pride in the place where they live - or leaves them empty, lonely, frustrated and uninvolved.

The way in which the physical components combine is what gives the feeling of the place, the opportunities for meeting socially, the quality of the "home" we make. All the physical and social components must combine in one harmony if the neighborhood is to be "home" - and not, as is the case in so many residential areas these days, a random slice of urban geography in which the buildings that are used for social activities are dispersed according to category administration, finance, etc. and are planned and operated by different departments that do not work in coordination and do not make it possible to create harmonious contact between the buildings for which they are responsible.

The dispersal of society's needs over monofunctional buildings, each in its own solitary place, and the uncoordinated processing of their construction by separate Government authorities (schools by the Ministry of Education, factories by the Ministry of Commerce & Industry, hospitals by the Ministry of Health, welfare by the Ministry of Welfare, roads by the Ministry of Labor, and so on and so forth) results in the urban fabric losing its content, its color and the interaction of its activities.

A true civilization can develop only in a hothouse in which all the activities that evolve are given proper expression, are in a state of mutual dialogue, and are free to affect and fertilize each other. In a civilized society, human life cannot be divided into well-defined, isolated, self-contained ages - infancy, childhood, adolescence, adulthood, old age - but is an uninterrupted flow from one state of living among people into another, in which a man's working hours are not only wasted on earning his daily bread, but are a qualitative part of his life and have a meaning-

fulness in their own right. Any system of social organization that separates the ages and isolates them from each other, that distinguishes between activities and isolates them, can only produce an alienated, sterile, monotonous community.

Historically speaking, the system of separating urban activities, of "Zoning" the urban space into insulated parcels of housing, work, leisure and transport, is relatively recent, for in the historical towns there was no such division and all urban activities were concentrated in a relatively small area. All towns where there is still a sparkling urban life and on which we look back with nostalgia - Paris, Venice, Old Jerusalem - still have this mingling of activities orchestrated into harmony. Incessant growth and the ubiquity of the motor car produce a situation in which one is out of the urban system.

Under the present customary system, not only factories, residential buildings, shops, markets, clubhouses, administrative offices and schools are kept separate (each on its own area and in its own style) in the town plan, but even buildings classified under the same type of activity are separated again and allotted one particular activity for one particular, clearly defined part of the population. Children are separated from the community for most of their active daytime hours and kept in educational concentration camps for at least ten whole years of their lives. Adults are shut away for forty hours a week in concentration camps of the lowest environmental standard, whether it is in "industrial parks" or in the ivory towers of office blocks gleaming with "respectable" finishes. Book readers are kept apart from sport fans - the former in the library, the latter in their stone-walled playing fields along a highway, well away from any residential zone (like the Country Club or the Tennis Center).

But the vitality of a town and all that is characteristic of the stream of life that runs in it is mainly the product of concurrent activities - concurrent in place and in time through all hours of the day and the night. Offices, workshops and factories, restaurants and cafes, pubs and houses should be intermingled in such a way that for most day and night hours there is social-cultural-human activity going on in the urban environment. One need only go to the housing estates or suburbs surrounding our cities, to Herzliah Pituah, Ramat Hasharon and so on, to understand how "dead" such places can be: nothing is going on anywhere. True, nobody wants to live in a hubbub of continuous activity for twenty-four hours a day, and privacy and quiet are an essential part of active urban life; and it is indeed possible and desirable to provide man with town and community life on the one hand and privacy and quiet on the other. But that does not mean that residential areas need to be separate, with the shop or the cafe a twenty-minute walk away, and going to work at the factory a matter of an hour on foot or half an hour by bus. To isolate the living space from the working, shopping, school and entertainment space is undesirable even from the sheer traffic viewpoint; for razing the walls that keep the urban activities divided will reduce appreciably the traffic volume and the rushing from place to place, and give access to productive and cultural activity to thousands of women who now stay at home because they cannot get away from it to any meaningful extent. The factories have long stopped being dark, satanic mills. Most factory buildings can nowadays be integrated in the neighborhood. They certainly should not have the disappointing pattern of the "industrial park" that has lately become so popular in Israeli town planning and that is predicated on the commercial mentality of getting maximum profit out of minimum investment. In Israel, we do not yet think in terms of industrial building for years to come. Except for heavy industry and chemicals, most industries can be clean and quiet and be integrated in residential areas, as is usual for schools. A condition of such integration is the rational separation of pedestrian and motorized traffic, so that industrial traffic does not destroy the pedestrian system.

Zoning is not the only thing that destroys the urban fabric. Another element to be got rid of is the separation of age groups within the residential neighborhood; and if there is already some awareness among our planners and administrators that the old must not be kept quarantined one way or another, we still set different categories of the population apart in isolated buildings of their own: housing schemes for "young" couples", for "slum evacuees", for "savers" and we still maintain an "apartheid" system for children by nursery schools, elementary schools and high schools, each on its own isolated site, usually on the edges of the neighborhood. A striking example is the recent building in Tel Aviv of three elementary schools on the Haifa-Tel Aviv road, next to and below a filling station. We have come a long way from the days when education was our first concern and the Herzliah High School in Tel Aviv dwelt in splendor at the top of Herzl Street, or the Technion in Haifa was built on the central site of Hadar Hacarmel.

Separating the school from everyday social activity helps develop school-resistance in the pupils: the far-off outside world seems more attractive and interesting. Municipal libraries are full of books and empty of readers in daytime, and school libraries poor in books and full of pupils; in such conditions, how can the young person and the adult be given a chance of meeting at the library? Lately, there has been some improvement due to the tendency of bringing cultural and sports centers into the school and enabling the available facilities to be used by the entire community of all age groups. But anyone who knows what administrative problems need solving in order to achieve such integration, must have asked himself whether the public exists to serve the administration, or the administration to serve the public.

Here in Israel, we have not yet adopted the idea of the day hospital, where the patients are not bedbound, but move around freely under medical supervision in daytime, and return to their homes for the night. The arrangement saves a great deal of manpower and integrates the hospital in the residential zone. The patients feel, psychologically, "healthy" rather than "dangerously ill" and are not gradually cut off from life. The trend in the direction of preventive medicine clinics may indicate a gradual approach to the day hospital.

We must find solutions that will allow public buildings to be used for more than one purpose at a time in a harmonious way. Multiple activities will bring people of different age groups, with different cultural backgrounds and different tastes together. We must think of buildings not as isolated, self-contained items in which a specific activity is pursued, but as center points for multiple unforeseen activities, capable of being used by people of all kinds and all ages in the neighborhood.

We must think of solutions for linking the public buildings to the fabric of the neighborhood's housing and commerce, so that they all can form one single unit, as in the Old City of Jerusalem, which is one single structure with one building merging into the other. This new, different approach will seek to convert the space that is formed between buildings into a space filled with human and social content, as a place for outdoor activities appropriate to the Mediterranean climate, so that not a single part of the town's land is wasted and left without content.

The Mediterranean climate permits urban life in outdoor spaces that are protected for most of the year and indeed, it is no wonder that the street and the public park were born around the Mediterranean, and that the arts of sculpture and painting flourished in this part of the world as a means of adding a ceremonial dimension to the multiple human activities for which the urban structure served as a framework.

But what happens here? The street, as we plan it today, is mainly designed for the car, which takes precedence on it. For the pedestrian, who is pushed aside to the margins, the street is designed mainly as the shortest distance between two points. Playing fields may be called public open spaces, but they are far from being town

squares: they are enclosed by fences, not by buildings, detached from all adjoining activity and in most cases are dead space without any activity; no plastic toy will help to entice the public to enter them.

Man, through his physical, emotional and intellectual senses, is active at all hours of the day, inside and outside buildings. The way in which he comes across public services and activities on his way from place to place is what mostly determines his attitude to and participation in them. We must therefore plan protected passages, vaulted shopping areas, places for walking, talking and drinking that are close, convenient and lead from everywhere to everywhere. If we accept the fact that cars and pedestrians do not mix and that one need not reach one's front door by car, we can plan the houses contiguously with protected, pedestrian-scale passages leading to the homes and opening up on corners for playing, sitting and shopping. We can plan little markets, kiosks, shops, nursery schools, bus stops and parking areas, with street furnishings planned in advance, and without all the paraphernalia of the car, like traffic lights, fluorescent lighting, billboards and road signs dominating the neighborhood picture.

Our present public buildings and public services structure and pedestrian systems come at the bottom of the planning and execution priority scale. Most housing developments now are built without the services that give the neighbourhood its character. The more we become conscious of population variations the more we shall have to build a more varied, richer public system and meeting places with more activities. That system must be built and function together with the dwellings, if we are not to build neighborhoods with shy, frustrated people living in them

The practice of using industrialized building with repetitive "types" of schools, nursery schools and synagogues seems entirely wrong; if our building must be industrialized at all, the industrialization must be applied to the category of buildings that come in large quantities and repeat themselves; namely, the dwellings which account for 80-90% of the whole urban fabric. Those buildings that provide services to the public and that give expression to the quality and culture of public activity within the neighborhood, and which do not repeat themselves in large series, should be left as the specific expression of particular situations and combinations of place, society and time.

A neighborhood that does not function from the moment it comes into existence, produces a population that loses its equilibrium, is embittered against the Establishment or the community, sits at home in front of the "idiot box" or rides from place to place in tin cans without doing anything. A non-functioning urban structure, in which the vacant spaces between buildings are empty of people and full of rubbish, produces non-identification with the place and produces drifting, helplessness and boredom among the younger generation and a tendency to alienation and crime, to revolt against the society which has led to it.

In the Israeli reality, no attention has yet been paid to the existing urban fabric in a way that could have produced an organic tradition of town life. Our housing schemes were always new, ex nihilo creations as it were; and in any new project in which the people do not exist in the flesh but only on paper, one tends to turn them into statistics: density per dunam, number of dwelling units, number of places of employment, of welfare cases, young couples, home saving schemes, and so on, and so on - formulas empty of human content as substitutes for real, live people.

Even the effect of social research studies is, ultimately, rather academic: they gather dust on library shelves and what they often really are about is getting the author a degree.

We are a people of "new immigrants"; and in the pressure cooker of the State, of

continuous meeting and friction, of wanting to assimilate and to belong, it happens that old traditions (which in any case do not take well in a new soil, climate and landscape) gradually dissipate, as does the "Zionist" dream of a people coming to life again in its own country. The vacuum that results cannot be filled with statistics of the typical "public housing project" with the monotony of the uniform living pattern that it imposes on the inhabitants, so that they become alienated from all urban social activity.

In this situation, the architect has a duty to be wary of simplistic solutions and off-the-cuff prescriptions which, to this day, have not justified themselves. We must seek those solutions that leave room for the new inhabitant to adapt them to his needs and to use them as a vehicle for self-expression; and that can be achieved by creating a number of basic alternatives on which he can imprint his own variations. The more man can act in and on his environment, the greater his involvement in the place; and the greater his involvement, the longer will his roots grow, the more attentions will he pay to his environment, until he at last lovingly makes the strange place his own.

What we planners offer the project dweller should not be a solution that is flexible enough to become anything because it is nothing, something neutral to which one does not know how to relate. We must offer him raw material that contains sufficient possibilities, so that he could choose the one to which he can mostly respond. We can never know what everyone who seeks a home in a new housing project wants, but we must seek a language that is rich enough for everyone to write his own line on the text in it.

We of the architectural profession must find the language, the grammar, the syntax that offers enough freedom for one to write prose and for the other to write poetry. We must discover the formal rhythms, the prototypes with social content in which people and the society can discover themselves; and the more they are able to stay within the built-in rules and restraints of that language, the more the words of the prose and poetry reach all, are understood by all and are accepted by all, the surer we can be that we are on the right way.

But just as we did not create the Hebrew Language ex nihilo, but built it up on the foundations of the language that was spoken two thousand years ago, and now we are adding a new superstructure to it that gives new contents to the old patterns, so we are not starting town planning on, as it were, a blank sheet of paper. Admittedly, in our very short history here in Israel there have been times when architects and administrators thought it was possible to start everything from scratch and that one could make "instant neighborhoods" like instant coffee. But today, after many experiments, we can look back and realize that we are only one layer of many layers that have existed in this part of the world and many others that are yet to come. Our layer will learn from the past, and through the past foresee the future. The transformation of the values and qualities of the past into those of a new time must find its expression in the criteria which we must lay down. We shall therefore do well to look around us at the traditional Mediterranean architecture and examine the basic, timeless values which it has established for itself, so that we can learn what it has to teach us for the stratum of contemporary architecture.

#### COMPONENTS OF MEDITERRANEAN ARCHITECTURE AND THEIR INTERRELATIONS AS AN EXPRESSION OF TIMELESS PLANNING VALUES

The house is constructed from a vaulted living space and an outer living space confined by walls (inner courtyard, atrium, patio). From the outside, the house is a blank wall with an entrance.



This construction permits houses to be built touching each other and makes it possible to create tightly knit housing clusters, with the spaces between the buildings forming the public space of the urban fabric. Creating the urban public space with its quality and characteristics was the main social effort in search of expression. The front of the house was always modest compared with the public buildings, which reflected the aspirations of the people and of the town as a community.

Inside the house, the inner courtyard provided the opportunity for division into, more or less, private wings, according to the family's needs, with most rooms of uniform size (4 x 4 meters), which allowed them to be used for different purposes from time to time, as the growth of the family or the change of the seasons required. Life between the walls that enclosed the house and its inner courtyard provided a feeling of security and privacy. The courtyard was what connected man with nature and gave him something like a private paradise, with a fountain, flower boxes, fruit trees and a pigeon coop as its main features.

The housing cluster is in many cases constructed like the Mediterranean house, with houses touching each other surrounding a small square that is enclosed by them and serves as a sort of common "staircase". This is the core and center of the housing cluster's social activities. In many cases, as in the Old City of Jerusalem, the cluster serves as the center of an entire clan. Thus the language of architecture begins to reflect a particular social structure which allows man to find his place within the urban fabric and provides a starting point for a scale, between the house and the town as a whole. The inner courtyard of the cluster does not exist in its own right alone, but is part of the pedestrian traffic system of the town as a whole. The courtyards, linked by alleyways, combine into the architecture of the pedestrian traffic system which makes the urban structure clear, intelligible and a means of orienting oneself in the urban space. This system suits the climate: it provides maximum shade, and is orientated so as to catch the pleasant westernly sea breeze.

#### Quarter, Main Square, Main Streets, Bazaars

The system of alleyways usually leads into a main square with a commercial, public and religious content. The square forms a quarter in its own right (like, for instance, the Armenian Quarter in the Old City of Jerusalem) which, defined by its square and gates, represents the ambitions, way of life and culture of its people. Each quarter has its own system of public services.

Several quarters come together at the main streets in which the main activity of the town itself is defined by the walls surrounding it and which are pierced by gates: Damascus Gate, Jaffa Gate, Zion Gate, etc.

#### Hierarchical Continuity as an Entire System

Houses to courtyard, courtyards to alleyways, alleyways to squares, squares to bazaars, bazaars to the city and the walls that surround it: that is an entire pedestrian system composed of different levels of dimension and the "transitions" between them, which together form the place in which the relationships between man and man and between man and his dwelling place develop: here grow connections, roots, identity and the imprint of the locality.

### Structural Elements of the Language of Mediterranean Architecture

The wall. The main element used to enclose areas and create a division between private and public areas is the wall. From the house to the housing cluster, to the quarter, to the town a system of increasing scales of activities is formed, in which the transitions from the most public to the most private scale, in a hierarchy of increasing privacy, is defined by city walls, house walls, gates, windows, balconies and doors.

The gate. The gate is what gives the feeling of "having arrived". It is the threshold that leads from outside to inside. Here the feeling of territory emerges. Around the gate, a whole complex of urban activities develops. In its planning, it comprises not only functional elements, but usually reflects the uniqueness and pride of the town and proclaims it to the world (as one can nowadays see in the gates people make for their villas). The gate is the place where most of the townspeople pass, which is why this was where the Sanhedrin (Council of Elders) held its sessions. There, justice was done for all to see. From the gate starts the bazaar, where the caravans used to bring their goods for sale. (The Armenian Quarter also has its gate. So has every group of houses in the Jewish Quarter of the Old City, and so, in turn, has each house.)

The balcony or porch. Lightly roofed or with a vine covered pergola, the porch provides the link between the private house and the public street. From the porch the people who live in the house share the life of the street like spectators in the box of a theater.

In Arab Jerusalem, the porch is glazed. In winter the glazing provides a hothouse effect and the porch is the warmest room of the house. In summer, the windows can be opened and shaded with plants or bed sheets. Thus the porch becomes a regulator of sun, wind and light between the outside and the inside.

The window. The deeply cased window is a space in its own right: a pleasant, definite transition from outside to the inside shade. Usually, it is protected by window shades of one kind or another. It can serve a number of purposes and be used as a bench, table or shelf.

Stairs and threshold. Stairs lead from one place to another: up to the unknown to reveal what lies beyond, down to what is seen lying below, from the general to the particular. On the threshold one appears like an actor on the stage, and steps down to join the public below.

Streets and alleyways. Pedestrian passageways, defined by the walls of buildings, shaded most of the day by the buildings or by pergolas or trees. From and in those streets, most of the town's activities take place, the invitation to join in them coming from the street itself. Each activity participates in the street and "goes out" to it in its own particular way.

Squares and gardens. These are defined by house walls. They are designed for spending time, sitting, relaxing, meeting people, and so on. This is where gossip starts and spreads.

Public buildings. These usually lie at focal points, at street crossings or on squares. They are given special architectural treatment and are landmarks by which one finds one's way in the general system of the urban structure.

All this provides us with the main notes in which urban symphonies have been written with the alphabet of the architectural language in which one can write poetry.

### Translating Mediterranean Architectural Values for Contemporary Use

From this alphabeth of Mediterranean architecture we can create our contemporary town planning language; and as Mediterranean architecture has its hierarchical continuity of integrated elements that contribute to the quality of life of the people who live in its buildings, so we can create a similar hierarchy in our urban community, with close interaction of its elements.

As a matter of fact, we have tried this last year at the Ministry of Housing to create a physical and valuative hierarchical system which amounts to a modern translation of traditional Mediterranean architectural vernacular, and attempted to establish criteria for the characteristics of such a system. Essentially, the system consists of a progression of:

- Housing clusters
- Pedestrian precincts
- Urban fabrics (communities).

Following are some details of this system.

#### THE HOUSING CLUSTER (OR SUB-NEIGHBORHOOD)

The housing cluster is a group of between 10 and 300 dwelling units (at ground level or on several floors) with entrances from a joint public area (street, square, garden), which gives them their identity as a group. This group is "the world and the fullness thereof" for the small child. In planning the cluster, the small child is the determining factor. In the public area of the cluster he first meets the outside world, nature and other children, and fights for his position in the society, in the accultured environment through which he takes his first steps in the community. Against this background an entire system of interrelations between children and between their parents develops. Here the system of neighborhood relations begins to take shape. The public area is and provides the physical expression of the housing units as a group and provides the transition from the dwelling unit to the precinct unit. The cluster is the system that creates the bond of neighborliness between the residents, the meeting place of children, mothers and old people. It provides public facilities from hot water, laundry (laundry rooms) and a communal television aerial to a shop, a club and a nursery school.

Housing units can be combined so as to form the bricks from which the architecture of the public areas will be built so as to provide a maximum of different situations for meetings between residents of the cluster of all ages.

The clusters also provide an infra-climate and a structured architectural atmosphere that favors meetings by providing the feeling of a place that is "protected" from strangers, heat (shade), wind (enclosing walls) and rain.

The buildings will be planned in adjoining groups, so as to avoid outside walls, heating by sun, wetness from rain, "wide open" public areas, and long walking distances from house to house and between houses and public services. Open public areas and long walking distances are inconvenient and give no physical expression to the group; they produce lack of identification with the public spaces, which consequently are neglected. They make it harder to find one's way in the physical space. Lack of definition between the group of units that forms the cluster and lack of definition of the buildings that form the precinct will reduce the formation of social relations between residents, encourage unfamiliarity and loneliness instead of producing social identification among the residents, between the residents and their place of residence, and between the residents and the natural environment. Here, architecture provides a "legible, understandable" physical urban

language in which the residents can enter into a dialogue with it, act on it and identify with it, so that they can strike roots in the place.

All this in contrast to present practice: both high-rise (high density) housing and single-story "build-your-own-home" (low density) housing nowadays results in a lack of human physical proportion and lacks the public spaces that bring man closer to his fellow man and to his dwelling place and that give meaning to the urban environment. The more our residential buildings grow in size, the greater becomes the effort needed to give expression to the single housing unit (so that it will not be one window in an endless row of identical ones). Translating physical size and adjusting it to the dimension of the human being becomes more and more important. Height means detachment from the ground, which is the natural plane for meetings between people. The connection between mother and child, between people and trees, between the proximate and the remote landscape undergoes a transformation for which the human solution has not yet been found. High buildings that dominate the landscape keep the sun out, cause whirlwinds, close off the landscape and turn the area surrounding them into an endless parking space. The traditional town street is turned into a car park, the entrance to the house is reduced to a magnificent elevator hall. The public area at the exit from the apartment is scaled down to a narrow staircase that not only does nothing to encourage relations between neighbors, but often becomes an actual source of quarrels. Today's customary building system leaves no room for self-expression, no opportunity of any human activity of stopping for a word with one's neighbor, meeting at the housedown or near the house. We now have asphalt surfaces that must be crossed in order to reach the "faraway" "fenced-in" playing field that belongs to nobody, so that no one living near it looks after it, as a result of which it becomes an unsupportable burden for the city as well.

Low-density "Build-your-own-home" building also has its disadvantages: it demands a more expensive system of roads and services (power, water, drains, telephone); it results in loneliness and lack of social, entertainment and educational activity - in fact, of any human activity at all, except by means of the electronic media (television, radio, taped music, etc.). All of which calls for the following conclusions, which in effect add up to a "guide for cluster planning":

The cluster is to be planned as a group of units of flexible form, organization and size so as to permit identity among the residents and allow their children to play together.

Public spaces between housing groups will be made from resistant easy-to-maintain materials so that the residents can maintain them in an organized fashion by means of a house or cluster committee. They must be capable of visual control and of being closed off by the residents. In fact, they will be delimited by the cluster itself and will be concealed within it as an organic part of it. They will be the instrument that gives the cluster its specific character, its physical definition and its official "address". They will define the entrances to the housing units and their integration in the general system.

The general traffic system must have a clear qualitative and quantitative hierarchy. It needs natural light in daytime and artificial lighting at night and must be sheltered from the climate and under the open eyes of the housing units, meaning that from every unit it should be possible to look out on, and take part in the life that goes on in it. In fact, the "watchful eye of the housing units" is the only means of providing a feeling of physical and psychological security without using protective fences or guards for the public system which becomes in effect a neighborhood theater in which the passers-by are the players and the housing units the spectators who see, take part and protect them, in the tradition of the "Street

theater" that is being revived these days. "Life's a stage..."

Each cluster must make the best of its particular situation in terms of place, time and program by stressing what is particular in it, so that no cluster will be like another. In order to underscore the uniqueness of each cluster, maximum use should be made of the effect of:

- topography
- orientation
- natural vegetation
- combinations of changing program
- preferred building methods of different building firms
- different visual expression of different internal organization of the groups within the cluster, in response to demands for different forms of housing and ways of life.
- treatment of public spaces and main entrances, and of the public buildings in those spaces.

Efforts must be made to assure that one cluster does not disturb the other and that public life in the cluster does not infringe on the privacy of the housing units of which it consists. Passages between public and private areas will be given suitable architectural expression: gates, thresholds, doors, walls, stairs, fences, etc.

The treatment of the cluster's public spaces will be of the same quality as that of the spaces inside the dwelling units. Consideration and foresight of the way of life, the residents' behavior, and the way in which the spaces will be used is essential.

All clusters will be planned so that traffic systems, services, conduits, parking and advance development will be as efficient, good and cheap as possible.

#### THE PEDESTRIAN PRECINCT

Today, there is a tendency of fragmentation of neighborhood activities and of uprooting them from the physical context of the pedestrian. The purpose of the pedestrian precinct is to unite those activities and to create within its confines a feeling of place, belonging and identification with the environment as it exists in the old towns. The feeling that gives the citizen pride in his town is something that is fast disappearing in the suburbs and towns we have built in Israel these twenty-five years. What makes a given project become a place that teems with life, is something we do not yet sufficiently understand; we have no clear answer yet to the question as to what makes the magic that breathes life in one place and not in another. Still, we must try to plan places where we can strike root in this country and make life well up out of the rock.

One of the reasons for the present fragmentation is the system of monofunctional zoning. One thing we should on no account do is plan monofunctional zones. We must mix the urban functions so that one influences the other, that one function produces resonances in the life that another function creates. When mother goes shopping, there is no reason why she should not pass by the school; when the school-boy has a free hour, there is no reason why he should not see his father working in the neighborhood; when a man is on his way to the library, there is nothing wrong about him overhearing a jazz concert on the way. A neighborhood that is isolated from other neighborhoods or from social and public services, from shopping, entertainment and work, has nothing to offer to its inhabitants. Involvement of

activities in the residential fabric and their integration in the life of the population is of prime importance in creating the feeling that the neighborhood is "home" and in turning it into "live" urban tissue. The more the social and public dimension "goes down to the People" instead of withdrawing itself in "ivory towers", the more this dimension presents a stimulating invitation to the people to take part in the life that teems in it; the more and wider range of activities is offered, the greater becomes, in proportion, the feeling of involvement and integration of the citizens in the life of the town, and thus the attraction of the urban fabric increases and the citizens' pride and participation in the creative life of the town is intensified.

The precinct combines several clusters, up to about 2,500 dwelling units, inter-linked by walkways along which all the public buildings which, taken together, can give the residents the urban awareness, are located. This system should be accessible to all dwelling units in the precinct; the distance should not exceed 400 meters.

This town planning system should provide urban services to all age groups of residents, of all cultural, income, trade and education levels. It should form a bridge between different population strata, create understanding, brotherhood and partnership between them. If the clusters can provide a characterization of different trades, stratifications, ways of life and income levels, the precinct must unite them all into one level. Most of the neighborhood's activities should be rooted in the basic neighborhood structure. There are of course types of activities that belong to the sphere of the city fabric and others that belong to the sphere of the regional fabric, but any activities that can be integrated in the planning and physical structure of the neighborhood will only help the inhabitants become rooted in the town; contrary to the present situation in which the housing developments produce indifference, anonymity and lack of social discipline, because they are fabrics devoid of content, mere dormitories, and cannot offer their inhabitants any variety of possibilities. If the precinct, as physical expression, is to underscore to its residents, the social "community" as a meaningful entity with its own identity, it must offer as varied urban functions as possible and be the link that connects the cluster on the one hand with the active urban community on the other. The pedestrian system must contain a combination of land uses that allow the residents opportunities of private enterprise and enable part of them to be employed within the precinct. These land uses will include a range of commercial services (retail and wholesale), non-polluting trades and industries (electronics, textile, repairs) and stores, professional and business offices, shops, cafes and restaurants, commercial entertainment, leisure activities, sport, research and development, etc.

The architectural elements that shape the pedestrian mall can present a translation of all the components that have grown on the shores of the Mediterranean: the square, the street, the market, the public park, the agora and the forum. These places must provide opportunities for spontaneous chance meetings as well as for planned meetings of different kinds. The maintenance of the system should be shared on clearly defined terms by the municipal authorities, the residents of the precinct and the public elements located in it. Priority for public transport and its integration in the precinct and its pedestrian system is of the highest importance. Private transport can remain on the periphery of the precinct, since it is mainly used for leaving the precinct and not for travelling inside it. In any case, transit traffic that does not belong to the precinct and is not generated by it, should stay outside. The pedestrian traffic system must remain separated from the private car system in order to provide maximum safety and to allow the public buildings to be integrated within one organic system. In other words, the pedestrian traffic system should pass not "by" but "through" the public buildings, so as to set up maximum friction between the residents and the public buildings that serve

them. The pedestrian system must play the main and decisive role in the social life of the precinct with all the activities that exist in it. It should reflect and express the community's culture and living habits and give them character and life by combining all activities and orchestrating them into one neighborhood symphony.

This integration calls on the architect for a maximum of inventiveness if he is to find answers for the desire for isolation and activation of every single component of the system. This requires finding the ideal compromise between opposite desires, for the good of all residents of the precinct.

Integration of activities will create a language in which there is an appropriate architectural expression for every variety of activity, in all its components. The more variegated the activity, the closer the integration, the more will the "local consciousness" and the feeling of the precinct's uniqueness increase; and that uniqueness is the result of taking the location, the topography, historical sites, the landscape, and the natural vegetation into account.

#### THE URBAN FABRIC (URBAN COMMUNITY)

The concept of the "urban fabric" or "urban community" is based on integration in the regional district on the one hand and on a bond between the precincts of which it consists, on the other. The concept arises from a way of thinking that sees the town as a "community", as an organic unity growing and functioning in a functional integration of the entire complex of human activities and all their components (man, society, landscape, motorcars), which adjust to each other in a continuous dynamic process, each at its own characteristic pace, in changing situations.

The "urban fabric" must create communication between one precinct and the other. This system of connections, which is mainly provided by the motorized traffic system and, in part, by the pedestrian traffic system, must be clear and easy for orientation. Crises in this communication or in understanding it by those who use it turn the urban fabric into an amorphous community that functions at a low level of understanding and causes frustration, while the end product is the breakdown of the structure of human contents and a flight to the suburbs.

The urban fabric links a variety of precincts into a complete urban complex which enables the citizens to identify with the community. The integration of urban life into a whole that enriches the inhabitants' patterns of life is a unifying and civilizing factor of the highest order which provides the possibility of a rich urban life that creates pride and satisfaction in the place, the society, and the natural environment.

The connection between the precincts requires a planning and functioning level that gives a specific identity to each single precinct on the one hand and produces overall integration on the other hand, without any side-effects of degenerating tension and uniformity.

In planning the system, one must provide for incessant growth, flexibility and re-examination of aims in the light of changes in the activities and events carried out by the people who live in it or visit it. This flexibility does not call for any blurring of form or identity, but requires adaptability of the urban structure to new unforeseen situations.

Generally, the precincts of which the urban fabric is composed are not uniformly programmed; each responds to a particular situation of urban grouping. Urban groupings can be the result of professional, religious or family connections of or

different wishes of population strata of different trends. The task of the urban fabric is to give an expression of identity to all these phenomena on the one hand and to combine them into an overall urban whole on the other hand. Though each precinct contains a particular, specific part of the public cultural system of the urban fabric, the fabric remains incomplete, poor and unsatisfying as long as all precincts together do not, as a group, supply services and opportunities for activities that can take place only on the "urban fabric" level. The need for integrating and locating those activities within the system is of the utmost importance; precincts that are unbalanced and defined in themselves but do not function in parallel cannot produce an urban fabric. The precincts must be interdependent and together maintain an entire system of concentrated public services that provide a choice of activities, while the whole is more than the sum of its single components.

The various components will include shops, offices, workshops, sports centers, entertainment centers, cultural centers and health centers that are tightly linked to the public and private transport systems, so that as many as possible of the population will pass through them; the purpose being that the urban society shall be able to provide and vitalize in its own specific "scale" all the services, aspirations and desires that are its specifics and characteristics. Together, the above components must provide the multiplicity of demand and satisfy the tastes of the majority of the citizens. Giving satisfaction to most of the residents of the community will assure that their emotional ties with the community will increase and pride of place will develop.

From first experiments at Gilo, Ramot and East Talpiot in Jerusalem, it appears at first sight that the minimum number needed to establish an urban fabric with a sufficiently large population to create the urban nucleus which we have described, is of the order of 30,000 inhabitants; it also appears that this community as a system needs to be connected adequately with larger urban centers, so that it shall be possible to satisfy all the residents' specific demands (university, hospitals, special shopping, employment).

The area needed for 30,000 inhabitants should be no more than 1,000 dunams and will have to lie within a radius of a kilometer, if most of the contacts within the community are still to remain within a quarter hour's walking. Each precinct will have to produce its own "territoriality". It must provide an awareness of entering, as in the Armenian, Jewish and Moslem Quarters of the Old City of Jerusalem. Its boundaries must be defined by buildings, roads or topographical features. The precinct must develop good neighborly features; with the surrounding precincts, and they all together must form a highly varied urban weave. A precinct must offer "inviting" conditions for visitors from other precincts who come there to play, shop, visit and go to school. The links will be made possible by public transport, cycling and walking.

The pedestrian system, transport and services must be highly efficient. In our planning, consideration must be given to the topography, the climate and the characteristic vegetation of the area.

#### THE STATUS OF ARCHITECTURE AND ITS CONTRIBUTION TO HUMAN NEEDS

We must try to go back to the point where our pioneering architects (Aryeh Sharon, the late Zeev Rechter, my late father) started planning the National Home some forty or fifty years ago. To them, modern architecture was to be an instrument by means of which new immigrants and the working class would obtain the best conditions for a decent life in the Land of Israel. That was how the first housing estate in Tel Aviv, on Frishman Street, Reines Street, Nordau Boulevard, etc. came



into existence.

The war against "orientalizing" architecture which those young architects waged in all sincerity, was not a war between the modern and oriental styles, but a war against an architecture that was not based on social content and did not take into consideration for whom it built and for what purpose - architecture including such buildings in the oriental style as the Technion in Haifa, the National Library on Mount Scopus, the first buildings of Little Tel Aviv and so on, all those buildings on which we now look back so nostalgically.

Since then, we have gone through a period in which architecture, which began by wanting to serve a society that was rebuilding itself anew, degenerated into fashion, while human needs lost their meaningfulness through the shrewd operations of elements concerned mainly with making profits. The only public body which can and must stand in the breach and protect the public good against the operations of commercial interests, is the Ministry of Housing. This makes it the more essential for us at the Ministry of Housing who are engaged in planning, to adopt some of the principles of modern architecture, such as:

a. Architecture is designed to serve human needs. Therefore these needs must be examined systematically and in depth. This will result in changes not only in the form of the buildings, but also in the atmosphere and organization of the urban fabric.

b. Architecture must make the fullest use of the potential inherent in technology for the improvement and enrichment of the quality of human life.

Human needs are the "what"; technology is the "how".

c. The "what" and the "how" will sometimes clash, particularly since (a) human needs is generally a static situation, while (b) technological development is a dynamic state. In the confrontation between human needs and the mechanical needs of technology, between (a) and (b), we must always remember that man must never become a slave of technology; on the contrary, the purpose of technology is to serve man. The interaction of man and technology stimulates the human imagination and produces new, fresh ideas.

d. The urban fabric and the architecture which gives it its physical expression is in a process of continual growth and organic change. As a result of these points (the continual necessity for satisfying human needs; technological development, and the interaction of man and technology), the growth and change take place in the context of what has been done in the past and what is aspired to for the future. They must therefore be seen as an unbroken historical continuity. Past experience serves as a touchstone and criterion of the future urban community.

Looking at what we have done in the building field since the establishment of the State, one cannot but reach the sad conclusion that the principles we have mentioned have been too often forgotten by those engaged in building, private or public. A conception has developed that believes blindly in the technology of the machine, a belief which in the past has taken the form of an uncritical attitude towards mass industrialization and the economy of large numbers, as though financial profit and economic feasibility are identical. The result was that those engaged in building (public and private) directed their efforts mainly at cost and profit. The uncritical attitude to industrialization in the narrow sense of the word produced "little boxes" and high-rise towers that cover the country in length and width. Most of those towers and boxes which we have built with sophisticated technologies imported from abroad, that were supposed to simplify the building process, are not only not cheap and not more efficient to build, but miserable, petty unsuited to the needs

of those who must live in them, inhuman, and beyond the financial reach of the Israeli citizen - all at one and the same time.

The blind belief in "engineering" and the failing to understand the meaning of "architecture" has in the past led to engineers taking control of town planning in Israel.

One needs only recall that most Israeli towns have a Town Engineer, but none has a Town Architect. Most building and town planning laws reflect the victory of mechanical functionalism over human needs. To take some blatant examples, there are regulations about the planning of roads, the permitted speed in residential areas, and the number of parking sites that have led to the ruin of landscaped and urban structures and to waste of public money, without contributing to the basic and psychological needs of man.

Another example is the clinging to the concept of "zoning", which has not proved itself as a criterion of good town planning, either in the world at large or in Israel.

Modern technology is one of the cornerstones of modern architecture and is capable of solving almost every problem, if the society is prepared to pay the price. Technology, like a gun, can fire in any direction; but, as we have learned in our military service, it matters who stands behind the gun, loads it, aims it and pulls the trigger. To this day, building technology has not responded to human needs, but like a robot dictated its terms for maximum profit in a minimum of time.

We must go back to our four principles. We must assure that every town planning problem is always reexamined again and exposed to new-openminded thinking.

That in fact, was the attitude underlying the establishment of the new planning team at the Ministry of Housing; a team which, in my opinion, must be structured in a way that permits turnover of manpower and a continuous infusion of new blood, young people, new ideas.

We must remind ourselves over and again that architecture is a social art, which must express and reflect the society for which it builds and the forces that shape the urban structure. The urban structure is the crystallization of the technical, social and moral forces of the society which builds itself the environment in which it lives. The urban structure reflects what the society spends its resources on, what it likes, admires, guards - or does without. The society which will come into existence as a result of planning on the basis of the ideals which built the State, will not be a society that lives by the need to produce more and more consumer goods, whether they are needed or not. It will be a society that produces in order to live, not one that lives in order to produce. In such a society there will grow an architecture that contributes to the content and enjoyment of life to such a degree that, when we look back at some future time, we shall wonder how people could live without it.

Here the question arises what the right place of the architect is in the system that builds the urban structure. It is a highly complex and complicated system and includes an enormously wide spectrum of trades and professions that do not speak the same language: a veritable tower of Babel of irreconcilable languages and aspirations. We have architects and engineers and quantity surveyors, landscape planners, utilities planners, power supply planners and road planners; land valuers, economists, sociologists and sanitation engineers, contractors, subcontractors and factory owners; and that is only part of it.

Roughly, all these occupations may be grouped into three categories which are at

times divided by gaps that cannot be bridged: The planning group; the building group; and the administration and control group. Conflicts occur between each of those groups and society, as well as within the group and within the society. Generally, one is very lucky that anything is built at all, since most of the time is wasted on internal politics and straightening out one conflict after another. This tendency is greatly reinforced in the absence of a joint basis and a common language which unifies them all. If at least all of them would start studying together (as is customary in medical school) before each profession splits off into its own specialization, it would be easier. It is our misfortune that the professions that engage in the planning and building of the urban structure have never shared the same school desk after they left high school.

As a result, no profession can relate to another profession or understand its ways of working, its thinking or the criteria by which it is guided in seeking solutions for the problems confronting it. The way in which one profession relates to and integrates in the overall problem is usually not noticeable at all. It is a matter of the devil take the hindmost.

Architecture is therefore not a matter of particular specialization, but encompasses all the other professions and attempts to mediate between them. It accompanies the process from writing the program to the point where the urban structure is populated by inhabitants and translates the desires of all of them into the documents that are issued for the building work on the site. No wonder that it is regarded as an art rather than a science, since the creative moment dominates. It is also accepted in the architecture profession that the creative urge must be accompanied by technological knowhow that can translate it into practical contents that can be built, and by administrative ability that is required to coordinate the planning process, the detailing of the building, and the execution on the site. That is the basis of the study of architecture, in which planning, technology and administration are learned together theoretically and practically at every stage (in theory, at least; it is not always what actually happens in architectural schools).

No wonder that when the Ministry of Housing was established, the planning team and the architects heading it occupied the dominant place in the system. Since then, the planning office has lost seniority and is now the stepchild of the system. This fact reflects a basic change of values: "How" has got the better of "what". Where building activity and building operations have become an aim in itself, the human content is lost.

We must distinguish between the term "building" and the term "architecture"; between "space" (or "roof") and "place". After twenty-five years of "building" in Israel, we can draw the sad conclusion that with our system of "building" we have not succeeded in creating a "place" anywhere - and that goes not only for housing projects, but also for public buildings. Take for instance all the public buildings along Shaul Hamelekh Avenue in Tel-Aviv, which, as a group, do not create any "place" between them; or all the different universities and technical academies. To realize this is the more important as we, as a society, have become more and more mobile, rushing in cars from one nowhere to another nowhere without realizing that we have quite incidentally destroyed any possibility of ever being somewhere. We deal with people as abstract numbers in objective programmes, statistical equations, modular coordination, simplification of the construction process, and so on, and regard creating a "place" out of a "space" as a near luxury rather than as a vital human need without which we shall not create a structured context in which a human society will be able to grow and exist in a civilized, satisfying way of life that provides the inner peace for a physically and spiritually full life.

We must create anew the system of relationships between a "place" and the processes of building and production, between "what" and "how". If we accept our present as

given, with its unceasing war between the desirable and the possible, between the freedom to build villas in Herzliah Pituah and the need to build housing development, between the individual and the community, then what matters is the process of decision-taking and the system of criteria which directs those decisions, in which the creation of a "National Home" and of "place" will achieve its legitimacy as an element that represents and reflects, in physical terms, the cultural aspirations of the community and builds the community in its own land, and expresses its physical and spiritual right on, and ownership of, that land.

The need for creating a "place" is not the natural result of production processes. What is available does not automatically provide the desirable. Creating a "place" is a qualitative, symbolic and emotional process. Production and building processes, on the other hand, are quantitative, dynamic and abstract processes. Nowadays, most of our activity is in the field of building operations which can be measured quantitatively and by which we measure our progress without paying attention to the fact that with our incessant urbanization we waste farmland, ruin wonderful natural landscapes and produce ecological problems. As long as the technology of the highway and the motorcar and the commercialization of land permit creeping growth and the swallowing of more land, while behind us we leave degenerate urban structures, and create a situation whereby reconstruction is much harder than occupying new, "empty" areas; and as long as preoccupation with production processes concentrates on the development of efficiency and building speed rather than on the quality of the product and of the urban spaces which it creates - as long as this happens, we lose our contact with the natural environment and with our own nature.

In the realization that we have lost our natural instinct for building and civilizing our own world, we have no choice but to stop the mad rush forward to nowhere, stand still, take a breath of fresh air, look around, and see from where we have come to where we stand.

The urban structure is neither a product of technological progress alone nor exclusively a work of art. Somewhere midway between the two we shall find the "golden section", if only those that occupy themselves with the process accept it willingly and not under compulsion, and when each of them has his proper venue to express himself and is given his proper weight. Any town planning solution, if it is to be human, must be variegated, many-sided and on many levels. Within these parameters, there is a place in the orchestra for all of us who are engaged in the building of neighborhoods.

# The Trade-off Between Density and Other Objectives: A Re-examination of Planning Norms

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## INTRODUCTION

One of the principal forces which determine the shape of a city is the trade-off between density and transportation costs.<sup>1</sup> If a given population lives at a lower density, the residents occupy a larger area of land - so travelling distances and transportation costs increase. Obviously, one way to economize on transportation costs is to crowd the population into a smaller area - that is, to increase the density. This will shorten travelling distances, and thus reduce transportation costs. However, increasing the density has its own drawbacks. Presumably, the concentration of more people into a smaller area will result in housing conditions that are less pleasant, and the well-being of the residents will decline. In the terminology of economists, the population will suffer a loss of utility.

In an optimal city, this loss of utility in a high-density area should be balanced against savings in transportation costs. Similarly, the advantages of living in a lower density should be balanced against the additional transportation costs involved (as well as any other additional costs, such as higher concentration costs.)

Transportation costs depend not only on the average density of a city, but on the whole spatial distribution of the population within the city. If more people live near the center, transportation costs will be less than if more people live further out. By changing the density in the various parts of the city, it is possible to greatly affect transportation costs. The optimal pattern of density under general conditions is described in Fig. 1. (See: Alonso (1964) Mills (1967) Muth (1969) and Borukhov (1973)). This can be achieved by increasing the density in central locations relative to peripheral locations.

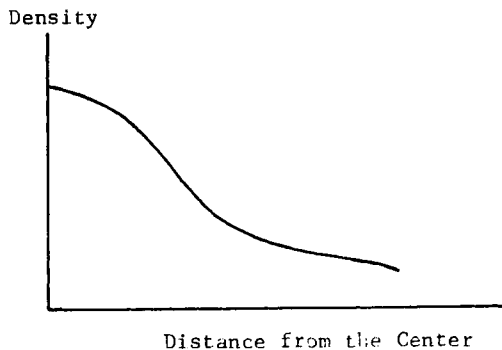


Fig. 1

An increase in the cost of transportation per km. changes the optimal pattern of density. It will be efficient to raise the density near the center until some point, and to reduce it near the boundary of the city. It will also be optimal to shrink the area of the city (i.e., to reduce its perimeter), so that the average density increases. (See Wheaton, 1974)

In the past, the invention of cheaper, faster and more convenient means of transportation enabled modern cities to develop with relatively low densities, and to spread out across enormous distances. However, the recent dramatic rise in the price of oil has multiplied the costs of transportation, and the costs are still going up. This new situation should change the trade-off between transportation costs and the advantages of lower density; consequently, patterns of urban land use should be re-examined. Patterns (and the transportation facilities implied by them) that were optimal at the old oil prices are no longer optimal today. Prima facie, it seems that higher energy and transportation prices justify more compact patterns of urban development and higher densities.

Few quantitative studies have been made to show exactly what is involved; however, some researchers have examined the problem in the American context. Their conclusion is that considerable amounts of energy can be saved if a strategy of more compact development is adopted. J.S. Roberts, for example, studied alternative development patterns for Washington D.C. for the next 15 to 20 years. He showed that the use of energy may increase from 38.5 percent to over 50 percent depending on population density. The highest increase will result from low-density development similar to the traditional development of the American city; the lowest increase will involve concentrating households and employment in the center at higher densities. The difference is the equivalent of 2.5 million tons of coal per year.

J. Edwards and J. Schofer (1976) concluded that "structural changes in transportation and land use patterns can produce significant reductions in energy consumption for urban travel". Structures with sprawling land use patterns have larger energy requirements than do relatively compact structures.

Consequently, it appears to be desirable to control the spread of cities, and to channel development into higher density forms. This objective should serve as a guide for rezoning requests and building permits. Certainly, more research is necessary in order to quantify the use of energy associated with different patterns of urban development, and to identify those which are the most efficient. However, saving energy is not the only objective of town planning. These savings have to be balanced against other objectives - such as more pleasant housing conditions.

This paper discusses the problems involved in estimating the value to the public of various levels of density - i.e., their effect on the well-being of the population. To begin with, we must clarify certain ambiguities that arise because of the many definitions of density and its many effects.

In the next section, we discuss some of the more important effects of density. Section III looks at the many definitions of density. In Section IV, we discuss the problems of measuring the effects of density on the well-being of the public. In Section V, we examine different approaches to the investigation of residential preferences. Section VI describes two studies related to the determination of density standards: utilization of open spaces, and preference for high versus low buildings.

#### THE EFFECTS OF DENSITY

Density is a central concept in the description and design of cities and residential

environments; it receives a great deal of attention from planners and policy makers. Density is believed to have far-reaching effects on many aspects of the quality of life. It is therefore natural that many planning systems have developed tools for regulating density.

Ever since the nineteenth century, density has had a bad connotation; it has been associated with slums, unsanitary conditions and sub-standard housing. The British writers of the Garden City Movement were advocates of lower densities. (See, for instance, Raymond Unwin, 1912). But others took a contrary view; Jane Jacobs (1961), for instance, argued that higher density facilitates social supervision - which, in turn, reduces crime and other forms of social deviation.

A recent survey concluded that "density though perceived as unpleasant does not appear to have definite and consistent detrimental social effects" (C.S. Fischer, M. Baldassare and R.J. Ofshe, 1975).

On the other hand, there is a relationship between density and the services that people can get within a given distance. Higher density may increase the choice of shops, schools and other services. When more people live within a given radius, more services can be economically provided within that radius.<sup>2</sup>

The intensity of land use affects the economic efficiency of urban settlements. Since land is scarce, increased density saves a limited economic resource. Moreover, higher density enables the development of a more compact city - resulting in shorter travelling distances and lower transportation costs.

A recent American study compared the capital costs, operating costs, energy consumption and environmental impact of low-density and high-density residential development. It calculated that a high-density community (19 dwelling units per net residential acre) would require a capital investment 44 percent smaller than that of a typical suburban low-density development (3.5 dwelling units per net residential acre). The largest proportionate saving would be in the construction cost of the residences. The high-density community would have an operating cost of 11 percent lower than that of the low-density community; it would require 44 percent less energy; and it would produce 45 percent less air pollution (see Alan Altshuler, 1977).

In Israel, the problem of economizing on land development costs is very serious for two reasons: 1) the continuous rise in the price of land in the main urban centers, and 2) the high cost of infrastructure construction, especially in the mountainous areas.

For instance, it is estimated that the price of residential land in Tel Aviv increased 13 times between 1960 and 1973 (an average annual rate of 21 percent, see Borukhov and Pines, 1975) other cities experienced similar developments. (Israel Land Administration 1975, p. 27). This rise was much greater than that of the general level of prices. The consumer price index rose at an average annual rate of 7.6 percent, during the same period. (See Borukhov and Pines, 1975 also Borukhov, 1965). This was a continuous process caused by the increase in the population of the cities.

In the past, when the government had big land holdings near the main cities, it used this land to build public housing at relatively low prices for less advantaged groups. The Ministry of Housing recently calculated that in the flat coastal plain, it does not have sufficient land reserves for its planned construction through 1980. Thus, the government must either convert some agricultural land to urban use, or shift a greater share of the public housing to the mountainous areas. However, in this less convenient terrain, infrastructure costs are higher. Comparison of these

costs in several recent public housing projects reveals the following picture:

Mountainous areas:

Jerusalem (East Talpiot)	IL 1,040,000 per acre
Jerusalem (Ramot)	1,518,000
Carmiel	1,915,000
Haifa (Amos)	2,810,000

Flat areas:

Ashdod	732,000
Beersheva	762,000

Obviously, one way to economize on the increased cost of land is to build at higher densities. For instance, it was recently calculated that if the cost of developed land is assumed to be IL 2,100,000 per acre, then increasing the density from 27 to 36 dwelling units per gross residential acre can result in a saving of IL 23,000 per dwelling unit (which is roughly 12.1 percent of the cost). (Ruth Friedman, 1977).

We have seen that density has numerous effects on the cost, the quality and the amenities of a residential neighborhood. Therefore, whether the density of a particular neighborhood (or the pattern of densities in a particular city) is optimal depends on all of the effects of density - because all of them bear on the well-being of the inhabitants. Furthermore, some of the effects have contradictory implications: some advantages can be achieved from lower density, while other benefits result from higher density. Clearly, determining the right level of density requires a balancing of all relevant factors in each case.

Furthermore, we must find a way to make quantitative evaluations of the various effects so that we can weigh them against each other.

MEASURES OF DENSITY

To complicate matters, the concept of density has more than one definition. When analyzing the effects of residential density, one has to be very careful not to confuse the various definitions. In particular, some influences of density are described better by some definitions than by others.

It is important to distinguish between net and gross densities. Net density refers to the net residential area (land covered by the buildings and private accessory uses (gardens, yards, parking areas, etc.)). Gross density refers to the entire area - the net residential area plus the streets, sidewalks, public open spaces (public parks, playgrounds, parking areas), and areas occupied by (or reserved for) public services such as schools.

Following are the definitions of several measures of density and related variables used in the literature (.e.g. Stuart Chapin, p. 429, Givoni and Paciuk p. 10-11, Keeble p. 252).

N.P.D. Net Population density: number of persons per unit of net residential land.

G.P.D. Gross population density: number of persons per unit of gross residential land.



- N.R.D. Net residential density: number of dwelling units per unit of net residential land.
- G.R.D. Gross residential density: number of dwelling units per unit of gross residential land.
- B.C. Building coverage: fraction of net residential land actually covered by the buildings.
- F.A.R. Floor area ratio: total floor area divided by net residential land.
- S.D.U. Size of dwelling unit: floor area of each dwelling unit, or number of rooms.
- H.D. Housing density: number of persons per dwelling unit (or per room).

There is no unanimity on the meaning of these terms. For instance, J. Stuart Chapin (p. 429) distinguishes between gross residential density and neighborhood density. The first refers to dwelling units per acre of land used for residences and traversing streets. The second refers to dwelling units per acre of land used for residences, local shopping, schools, public open spaces and streets. (See, however, also Lewis Keeble p. 253).

Clearly, certain simple mathematical relations exist between many of these definitions - such as floor area ratio, net residential density and size of dwelling unit. Thus, a change in one of these variables, say N.R.D. results in a corresponding change in another, say F.A.R., if S.D.U. remains constant.

However, there are several situations in which one measure of density will increase when another falls, and vice versa. If the size of the dwelling units is increased, this will increase the floor area ratio - but the net residential density will not change. It will take a decline in the number of dwelling units to result in a decline in net residential density when the floor area ratio rises. In this situation, it is not clear which is the "right" measure of density; it depends on which influence is under consideration. Are we interested in minimizing costs or in maximizing residential satisfaction?

From the point of view of economizing on land utilization and construction costs per person, the relevant concept is gross population density. But this is not necessarily the key factor in maximizing the satisfaction of the residents. What if the inhabitants do not perceive density as it is measured, but rather are affected by other variables such as the percentage of building coverage, distances between the buildings, details of the layout, etc.? In an American study, a very low correlation was found between the actual objective density and the subjective perception of density ( $R=0.47$ ) (Robert Marans and Lewis Mandell, 1972).

It seems that the perception of density is influenced not only by the objective density (i.e., the number of dwelling units per acre), but by other factors as well. It is not known exactly what people mean when they complain about high density. Do they have in mind the lack of privacy? (as suggested by Clare Cooper, 1975). What kind of privacy? Is it the lack of light and fresh air, or is it the lack of open space for children to play, for parking or for gardening? It is certainly possible that different groups of people have different views of what constitutes desirable housing conditions.

Schiffenbauer et al. demonstrated that the perceived crowdedness of a room is

affected not only by the size of the room, but also by other features such as internal arrangement and level of illumination (see A. Schiffenbauer, et al, 1977 see also D. Stokols, et al, 1973). However, this refers to the feeling of space in a single room. We have more relevant evidence which pertains to people's reactions to the density of a neighborhood. This evidence comes from an investigation which was carried out in Kiryat Gat in 1975 (see E. Borukhov, Y. Ginsberg and E. Werczberger, "Social Aspects of Housing Density", Working Paper No. 32, Center for Urban and Regional Studies, Tel Aviv University, July 1976 - Hebrew).

Kiryat Gat is a new town in the south of Israel. In 1975, its population numbered approximately 22,000. The study was conducted in the Glickson neighborhood, which was an experiment in integrating diverse population groups (See Marans, 1970). The neighborhood occupies approximately 27.4 acres, and contains a variety of building types. Gross residential density is about 21 units per acre. A probability sample of 150 households was chosen from the 575 families in the neighborhood. The main purpose of the research was to study social integration (some results of this survey are reported in Y. Ginsberg and R. Marans, "Social Mix in Housing, Does Ethnicity Make a Difference?", 1977).

Thirty-one of the respondents complained that the neighborhood was too crowded. These complaints were made spontaneously, before any direct question was asked about that point. About half the people who complained about overcrowding were residents of the single-story and two-story buildings - and not of the multi-family buildings. On the other hand, only two out of 79 respondents living in the large multi-family buildings with 48-56 families complained about crowdedness.

Another interesting finding is that respondents who suffered from high housing density tended to complain about the density of the neighborhood much more than did families with lower housing density. The study asked respondents whether too many, too few or about the right number of people lived in their immediate environment. The majority answered that the number was right; approximately one-third answered that the number was too big. Only 12 percent of the households with one person per room or less complained of too many people in the neighborhood, while more than 50 percent of those with more than three persons per room complained.

#### THE PROBLEM OF TRADE-OFF

The gross population density of a neighborhood is the result of three variables:

- (1) The proportion of land allocated to public non-residential purposes.
- (2) The number of dwelling units built in the residential area (the net residential density).
- (3) The number of persons who occupy each dwelling unit.

The third variable is largely outside the control of the planning authorities; it is determined by the inhabitants. On the other hand, the first two variables are subject to planning controls; the question is whether the existing design norms and regulations achieve maximum well-being for the residents of a neighborhood (subject to the limitations of their budgets). Clearly, the norms should be compatible with the preferences of the potential residents. The designers should know the residents' relative evaluation of the various attributes of housing - particularly the trade-off between the characteristics of their dwelling unit and of the neighborhood.

Before we turn to how this can be done, we shall discuss certain aspects of the nature of housing.

Housing is a complex bundle of disparate commodities: brick sidings, floor space, partitions, permission to send children to a certain school, exposure to certain levels of pollution, a location that is certain distances from various places (work, shopping, schools), etc. These components of the dwelling unit serve numerous needs of the occupants - such as accessibility, convenience and privacy.

We hypothesize that the satisfaction of needs is the relevant factor in people's well-being; therefore, these needs ( $N_i$ ) should be the arguments in their utility functions. On the other hand, the components ( $G_j$ ) are the arguments in the cost functions.

Thus we have utility functions:

$$U = U(N_i)$$

and cost functions:

$$C = C(G_j)$$

and functions which relate components to needs:

$$N_i = f(G_j)$$

By substitution, we get  $U = U(f_i(G_j))$ .

It should be recognized that there are  $i + j$  ways to economize on the design of housing. We can choose the proper level for satisfying each need, and the proper combination of components to yield - at the least possible cost - a given level of satisfaction of a certain need.

Each component of a dwelling unit can provide slightly more or slightly less satisfaction of one or more needs. Very few people - if any - can have their ideal home; most people have to compromise. They trade-off one component against another - for instance, accessibility against space. Since houses that are farther away from the city center are generally cheaper, a given amount of money can buy larger homes in these distant places. Each household makes its own decision as to the most desirable compromise among the various components of a home.

#### METHODS FOR IDENTIFYING PREFERENCES

Basically there are three different methods for identifying the preferences of residents: analysis of their behavior, direct questioning on their attitudes, and trade-off games.

##### Analysis of Behavior

Analysis of behavior is based on the assumption that preferences are best revealed through what people do rather than by what they say. The difficulty is in interpreting the motivation behind the behavior. Three main approaches have been used:

- (1) On-site observation of the actual use of facilities and their maintenance (Cooper, 1975) Shankland, 1973). The same information can often be obtained far more easily through interviews.
- (2) Analysis of statistical information on relocation (De Jong, 1977) or differential crime rates (Newman, 1973).

(3) Multiple regression analysis of house prices as a function of the characteristics of the dwelling and the neighborhood (Borukhov, Ginsberg, and Werczberger, 1977; Ball, 1973; Kain and Quigley, 1970). These provide estimates of the prices of houses and neighborhood attributes - which can be interpreted as the relative values assigned to these attributes. However, such estimates are inevitably suspect and somewhat unreliable - because of collinearity, heterogeneity in tastes, market imperfections, separation of submarkets and omission of variables (Borukhov, et al, 1977).

Preliminary findings from Tel Aviv indicate that about 12 percent of the variance in apartment prices can be explained by neighborhood characteristics (as opposed to attributes of the apartment and the building). This was almost exclusively the effect of the socio-economic status of the inhabitants (Borukhov, et al, 1977). However, it was impossible to identify the separate effects of the physical characteristics of the neighborhood and the quality of the public services.

#### Direct Questioning of the Residents on their Attitudes

Direct questioning of the residents on their attitudes gives some insight into their preferences and motives. On the other hand, the reliability of this method is limited in the absence of a test of the relationship between what people say and what they do. Two approaches have been tried. The first asks a single group of residents about the extent to which their neighborhood's characteristics and design principles meet their needs (Cooper, 1975; Shankland, 1973).

The second approach is more relevant - but methodologically more difficult. It examines the difference in satisfaction from neighborhoods built according to different planning principles. Such evaluations include comparisons between neighborhoods developed at different densities (Zehner, 1973), planned versus conventional "unplanned" neighborhoods (Lansing, 1970). If the variance in satisfaction is sufficiently large, one can try to identify the main influence - such as apartment maintenance or the quality of educational facilities (Onibokun, 1974).

Alternatively, it is possible to aggregate the responses in order to compare satisfaction with different neighborhoods (Onibokun, 1973). However, these studies are open to serious criticism: it is likely that the respondents have already located themselves according to their preferences - that is, people who like a particular type of neighborhood are more likely to live in a neighborhood of that type than are people who dislike it.

Most studies in Israel have been limited to single neighborhoods. Even if families from more than one area were interviewed, the samples were not designed to compare neighborhoods of different natures.

#### Trade-Off Games

A major difficulty with direct interviewing is the inherent difference between subjective rating of neighborhood characteristics and actual housing choice involving trade-offs under financial constraints. One way to get insight into this choice is to use trade-off games, which have recently been experimented with (Hoinville, 1971; Robinson, 1975). However, no comparison is available yet between the results of these games and real-life decision behaviour - so the reliability and value of this research method are still unknown.

## TWO EMPIRICAL STUDIES

Do existing norms and regulations controlling (1) allocation of land for public purposes, and (2) net residential density, achieve maximum well-being for the inhabitants of the planned neighborhoods? Not enough research has been carried out in Israel to answer this question conclusively. However, two studies raise doubts about the existing conventions and norms. One examines the norms of open space, and the second investigates low versus high-rise buildings.

These studies are described not because they are exhaustive or conclusive, but because they are addressed to the relevant questions - and because they are examples of different approaches to the investigation of residential preferences.

### Utilization of Open Spaces

The investigation consisted of observing activities in the open public spaces in the Glickson neighborhood of Kiryat Gat. Observations were carried out during one week in the summer of 1974. An investigator visited twenty-two "stations" at different times during the day. Open spaces were checked to see how many people were present and what activities were going on. These spaces were parking areas, playgrounds and public parks.

It was found that these areas were used very little. Some areas were particularly noticeable for their low utilization. At no time were children observed playing in the specified playgrounds. On the other hand, children were playing ballgames and riding bicycles in areas not intended for that purpose (and were interfering with other activities). The importance of this finding is indicated by the substantial areas that are set aside for playgrounds and the large sums of money that public authorities spend on such facilities.

At the center of the neighborhood - between the local school, the shops and the clinic - is a plaza. It was planned as a hub for pedestrians and a central meeting place for the residents of the neighborhood. But the plaza is not used. People prefer to walk along other routes which are shorter or more convenient. In fact the plaza is neglected and has been allowed to deteriorate.

This study raises more questions than it answers. In particular, it questions the validity of current planning standards and conventional professional wisdom.

### Low Versus Walk-up High-Rise Buildings

One of the major questions about the effect of net residential density on the satisfaction of residents involves the preference of the public for low-rise versus high-rise buildings.

If people are less concerned about the height of buildings than they are about building coverage, setback distances, etc., then planners can provide more open space (private or public) while maintaining the same net residential density by constructing higher buildings. The additional open space, if used judiciously, can provide more privacy and higher aesthetic values.<sup>3</sup> On the other hand, higher buildings do have some drawbacks; the problem is to weigh the advantages against the disadvantages.

The choice between higher buildings with more open space and lower buildings with less open space requires a quantitative evaluation of their effects on the residents' well-being. Measuring the willingness-to-pay of the residents is involved

here since part of the question is: how much is an extra unit of well-being worth in terms of expenditure on housing? Clearly, the answer can vary from case to case - depending on the circumstances of the people concerned, their financial resources, their cultural backgrounds and their tastes.

Below, we describe an investigation into preferences for low versus walk-up buildings in Israel. A representative sample of 1012 of the urban population was interviewed (see Dan Soen, 1977).

First, respondents were asked which of the following two basic types of buildings they preferred:

(a) Multi-story walk-up buildings. The ordinary walk-up apartment house of up to four stories is the most common type of housing in Israel; 81 percent of the respondents lived in buildings of this type. (Buildings with five or more stories must have elevators).

(b) Low Buildings. Such as detached single family houses and row houses. Each dwelling unit is attached to a piece of land, and usually has a private entrance (not through a staircase).

Sixty percent of the respondents said that they preferred to live in a low building. This is in striking contrast to their actual housing, since 86 percent of them lived in multi-story buildings.

Those who lived in a multi-story building and said that they preferred to live in a low building were asked if they would exchange their present dwelling for a single-family house of the same size in the same area. Only 53 percent expressed a willingness to do so. These were then asked whether they would trade their present apartment plus IL 55,000 to obtain that single family house - and more than four out of five said no, although IL 55,000 is less than the difference in the market values of these two types of housing.<sup>4</sup>

Those who said that they would pay IL 55,000 did not sign on a legally binding contract; some of them would probably have acted otherwise if they had actually been presented with an offer. Even disregarding the gap between word and deed, we are left with an interesting finding: of those who lived in multi-story buildings, but said that they "preferred" to live in low buildings, only half said that they would trade homes - and only 17 percent said that they would add a sum of money to the deal which was less than the difference in value.

This indicates how careful we have to be in the study of residential preferences.

#### CONCLUDING REMARKS

A residential neighborhood is a very complex commodity with many characteristics. Usually people trade-off one attribute against another. For instance: they can trade-off density against cost or accessibility against space. The aim of good planning is to find that combination of characteristics which will give the maximum level of satisfaction to the residents of the neighborhood (subject to the limitations of their financial resources). Therefore, planners should be aware of the prospective residents' preferences and the relative evaluation of the various characteristics of their environment.

As we have seen the density affects both the quality and the cost of residential development in many direct and indirect ways. Clearly determining the optimum

level of density requires a balancing of all relevant factors. Density standards should be adapted to the preferences of the potential residents.

To complicate matters, the concept of density has many definitions. It seems that people are not concerned about the concept of residential density but are affected by related variables, such as set-back distances, percentage of building coverage and the like. Consideration of these variables is therefore extremely important. If the aim of good planning is to design neighborhoods matching as closely as possible the preferences of their inhabitants, then, planners should have quantitative estimates of the residents' relative evaluation of these characteristics and their preferred compromise between the various attributes, including possible savings in the price of housing. Clearly the preferences of the residents can vary from one case to another depending on the circumstances of the people concerned, their financial resources, their cultural background and their tastes.

In view of the major role played by density standards in determining the costs of residential development, and the importance of having quantitative estimates of the value to the public of various density standards, it is surprising that only a few studies have been carried out to obtain such estimates.

#### FOOTNOTES

1. In this paper, the term density refers to the number of persons per acre. We shall also discuss other definitions of density.

2. For instance: "If  $\frac{1}{4}$  mile is accepted as a desirable maximum distance for a child's journey from home to primary school, houses planned at too low a density will conflict with this. If the density is increased to the point at which the population sustaining a primary school is contained within a  $\frac{1}{4}$  mile radius, this conflict is overcome. As the density is further increased, a choice between several primary schools within  $\frac{1}{4}$  mile becomes possible. What applies to schools applies in varying degrees and scales of distance to the whole range of social meeting places in residential areas, of varying degrees of importance and interest to particular types and groups of people (e.g. play areas, shops, pubs or churches)". Greater London Council (1965) p. 41. The Planning of a New Town.

3. This was recognized by Raymond Unwin, one of the founders of the British Garden City movement. In 1902, he wrote: "In this manner (in squares) from twenty to thirty houses according to size can be arranged to an acre, including streets, and this number should nowhere be exceeded except under very great pressure. Even if it must be exceeded, probably it is better to go up and make extra floors, let in flats, than to curtail the open space. One larger space of ground is more effective than a number of small yards. The distance across, preventing the over-looking of windows would ensure the essential privacy of the house in spite of the want of backyards."

4. In most parts of the country, the cost of land and its development (roads, water-mains, sewers, etc.) is so high that the difference per dwelling unit is more than IL 55,000. If the cost of land and infrastructure is IL 2,000,000 per acre, and 40 dwelling units are built in multi-unit buildings, then the cost of improved land per unit is only about IL 40,000. However, if only 20 dwelling units are built (with only 210 square meters of land per unit), the cost of improved land per unit goes up to IL 100,000.

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# Residential Density in Urban Planning

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## WHY STUDY NET RESIDENTIAL DENSITY

Residential densities as defined in town planning schemes are one of the main factors creating environmental conditions in the dwellings and the residential areas as a whole. For many planners, architects and developers in Israel, density is defined by "magic numbers" in regulations. These are sometimes agreed or objected and more often not really well understood except for providing building rights.

In order to understand the social benefits and costs of densities, a study was commissioned by the Programming Division of Israel's Ministry of Building and Housing, to provide guidelines for defining densities in planning and evaluation alternative schemes and layouts in relation to densities. This paper summarizes the first part of the study, dealing with net residential density (NRD). It shows a way of defining ranges of NRD, based on users requirements, building types and costs.<sup>1</sup>

The stated aims of the Ministry of Building and Housing in its programme of work for the next four years are:<sup>2</sup>

- a. Assuring appropriate housing services for young couples, new immigrants and other sectors of population.
- b. Geographical dispersal of population according to Government policy.
- c. Include environmental considerations in housing.
- d. Encouraging use of technological developments and regulation of the Building Industry.
- e. Efficient use and proper maintenance of dwelling stock.

This study is related to the first and third aims, as influenced specifically by NRD, in large housing estates as developed by or through the Ministry; but its conclusions are also valid for smaller residential areas in existing towns.

## SOME DENSITY-RELATED PROBLEMS IN ISRAEL

In established and developed towns and cities, densities are defined mainly in outdated outline schemes by coverage and number of floors; additional floors were later gradually added, mostly without considering necessary increase of public areas.

High densities in those towns, specially in central areas, are also a result of pressure by private and public building companies.<sup>3</sup> In new towns, a Garden City

approach was adopted and low densities established; low density-semiagricultural developments were also adopted in some suburban parts in older towns and smaller Development Towns being uneconomic in terms of land use, development, maintenance and operation costs. In high densities areas, often little adjustment to public facilities was made, no relation to size of flats and densities, and only rarely public needs were related to assumed or planned size of families and their needs.

#### BASIC ASSUMPTIONS OF USER'S REQUIREMENTS

The user's requirements in dwellings, the net residential plot, the neighbourhood and the whole town were studied. Accordingly the relation of:

- a. Persons and families,
- b. Built area,
- c. Open space for leisure, play, parking and access,

are defined in respect to the net residential area.

Based on the user's requirements, normative assumptions are made:

1. The area of dwellings is related to planned or assumed family size
2. Open area on the ground needed for adequate leisure, play and access to buildings was defined based on local and foreign latest studies. The norms would be checked by trade-off according to geographical region, location in town, balance with public open areas.
3. Car parking standards are related to the forecast needs of the planned development.
4. Environmental considerations of climate, mainly ventilation and sun radiation, daylight, noise intrusion and privacy lead to normative guidelines to achieve minimum requirements for adequate conditions:
  - i. Climatic conditions in the Coastal Area of Israel, demand relatively large spaces between buildings, open ground floor and of rooms where main openings face north and south, to provide best ventilation and sun radiation exposure.
  - ii. Although Israel has relatively high radiation in order to provide a framework for adequate daylight, spacing between buildings should be not less than the height of the nearest building (H) facing secondary openings of living rooms and bedrooms.
  - iii. To avoid nuisance of loud speaking (75 DBA at source) at the distance of 10-15m noise is decreased to approximately 35 DBA. Greater distance is preferred, but beyond 30-40m between buildings, if no "noise tunnel" is produced by long and high buildings facing each other, the acoustic benefit is marginal.
  - iv. Privacy depends largely on design and building details, but it is assured that spacing of 20-30m between buildings of three or more floors is enough to avoid intrusion of over-

looking and that at more than 40-50m the marginal benefit is negligible.

#### GUIDELINES

According to those assumptions the following basic guidelines were adopted for spacing between buildings although deviations can be made with specific design and building details, trade-offs, etc.

1. Spacing between exterior walls with main windows and other openings is  $1\frac{1}{2}$  the height and for walls with secondary openings, 1 height of the nearest building, and not less than 20-22m.
2. Only in low-rise buildings a minimal space of 10-16m for one-storey buildings and 15-20m for two-storey buildings was established, because fences and planting diminish noise intrusion and increases privacy.
3. Open area on the ground should be 8 sq. m. per person as a norm, and not less than 5.5 sq. m. as minimum standard.
4. Additional guidelines are recommended for residential development; although they influence densities only indirectly, they do influence the environment quality of the design in the various density ranges:
  - i. Adequate spacing of residential buildings is important specially in the warm and humid summer, in the coastal belt of Israel and similar climates.
  - ii. 8-12 storey buildings could have smaller than recommended side spaces, with adequate window details to avoid noise and privacy nuisance.
  - iii. Orientation of long walls and main openings of living and bedrooms should face preferable southern orientation. Second best for living rooms is the north (especially in the coastal strip, Jordan rift, and desert area), and for bedrooms, the east.
  - iv. Allocation of parking on the residential plot should be next to the road, to avoid multiple direction of noise and air pollution in dwellings.
  - v. For families with children, low buildings up to 3-4 storeys are preferred.
  - vi. In terms of reducing noise nuisance, sun radiation, increased privacy and energy saving (heating in winter and air-conditioning in summer), compact building is preferred to "open" design. By compactness, the minimization of external walls is meant, but in the coastal strip, it is a main concern that all rooms should provide at least two openings for effective cross ventilation.
  - vii. In a range of medium to high densities, less people per staircase and per private open area, are preferred to avoid

crowding effects.

### MODEL FOR EVALUATION

For the evaluation and comparison of alternative schemes and layout of various densities, a model was developed. The model defines the various components of density, the factors which determine the density and the preferred criteria and guidelines for evaluation.

Related to the criteria, the specific data of each plan will be evaluated and defined in relative ranking.

TABLE 1: Model for Evaluation of Densities in 3D Schemes

<u>COMPONENTS</u>	<u>FACTORS</u>	<u>CRITERIA &amp; GUIDELINES</u>	<u>EVALUATION</u>	<u>RANKING</u>
Physical environment:				
Building	size area on ground visual cost			
Open Space:				
Spacing	climate ventilation sun radiation daylight noise privacy visual			
Open Area on Ground:				
Green area	size (square) form maintenance & operation visual			
Parking	size form location visual			
Social & Psychological	no. of residents accessibility to open areas variety orientation safety and control			

Parallel to the qualitative evaluation, a cost breakdown is prepared for the whole project and for the various heights and types of buildings.

The examples studied were those most commonly built by the Ministry's initiative (Shikunim-Residential estates) and also apply to many developments in the private sector.

The model was applied to various densities in different 3D designs with various heights of buildings, building types, sizes of dwellings as built by the Ministry.

- a. Heights of buildings: 1,2,3,4,8 & 12 storeys.
- b. Types of buildings: individual (1 - 2 storeys)  
                           semi-detached (1 - 2 storeys)  
                           low house (1 - 2 and 4 storeys)  
                           "square" houses (3,4,8,12 storeys)  
                           with 4 dwellings per floor on a common stair-  
                           case (Buildings of 4 and more storeys have an  
                           elevator.)
- c. Average size of dwellings: 75 sq. m. for 3.6 - 5.5 persons per  
                           family (for calculation of user's requirements).<sup>5</sup>
- d. Parking: 1 car per family on the ground.

#### FINDINGS

The maximum ranges of densities for buildings of various heights, within the range of desired or acceptable environmental conditions and fulfillment of user's requirements are:

TABLE 2: Ranges of Densities in Various Building Heights and Family Sizes

Height of Building (storeys)	Density (Dwellings per dunam) (6)	
	5.5 persons/family	3.6 persons/family
1	2.5 - 6.4	
2	2.8 - 7.7	
3	8.0 -12.2	
3 & 4	- 9.0	
4	9.0 -13.6	- 14.5
4, 8 & 12	-11.0	- 18.6
8	-14.5	- 18.6
12	-14.5	

Within the above ranges the lower densities provide better environmental conditions and user's requirements than the higher although these are also adequate.

Many variations of densities are possible by mixing various heights and types of buildings within the defined ranges. Some examples are: (See Table 3)

For bigger flats (more than 75 sq. m.) even with same or lower family size, lower densities than those defined above are necessary to provide adequate environmental quality of ventilation, daylight, noise and privacy, provided by spacing.

TABLE 3: Some Density Ranges in Heterogenous Schemes

1 Storey	2 Storeys	3-4 Storeys	Average Range of Densities (Dwellings per dunam)
1. 10%	40%	50%	5.2 - 9.2
2. 25%	40%	35%	4.0 - 7.6
3. 35%	65%	-	3.4 - 6.3

For bigger families, lower densities are required to provide adequate open area on the ground for user's requirements.

The cost analysis shows that:

1. The cost of the building is different according to the height of building. 1-2 storeys are more expensive than 12 storeys, these more than 8 storeys and these more than 3-4 storeys.
2. The land price is a major factor influencing cost of project.
3. Soil type and slope determine the development costs per area, but these costs are almost not influenced by the number of dwellings per area.
4. The aggregated cost of land and development is thus related to the density: the higher the density of dwelling units per area, the lower are the development and land prices, assuming for the comparison that these are independent from the intensity of use.

For example, on land costing IL 150,000/D the cost per dwelling including building, development and land costs are shown in the following table.<sup>7</sup>

Within a range of medium to high densities (8-24 dwellings per dunam net), in lower densities, higher qualities are achieved at a relatively small increase of costs per dwelling. The difference of cost of 4 storey development at 13.6 Dw/D to 16Dw/D is IL 3,000 (2%) and achieves 31% increase of open area on the ground.

Higher densities than 15 dwellings per dunam (net) for families with three children or more can only be achieved if user requirements on the ground are below accepted norms; and higher densities than 18 dwellings per dunam, for the same family size, in 8-12 storey buildings do not provide the desired environmental conditions.

Maintaining a similar range of "packages" of environmental qualities and user requirements, 8-12 storey buildings have almost no advantages in net density terms on 4 storey buildings, but increase the costs significantly. Some improved environmental conditions in high-rise buildings, such as larger spaces between buildings, with more daylight and better ventilation, are outweighed by social and psychological disadvantages for families, e.g. overcrowded common areas, disconnection from the ground, maintenance and operation difficulties.

Assuming similar environmental conditions and user requirements, the main factors



influencing net residential densities are family size and compactness of building, but not height of buildings.

Low-rise housing (1-2 storeys in singles, semi-detached or row houses) is more expensive than 4-12 storey houses, but at IL 150,000 land prices the higher range of density of 2 storey row houses costs IL 185,000 at 6.1 Dw/D or IL 176,000 at 7.7Dw/D against 4 storey houses at 10.0 Dw/D which cost IL 172,000. The difference is negligible against the increase of environmental quality, especially privacy and possibilities of adding additional building area as needed by users and more open space on the ground.

The social and environmental benefits are even more important for big families who anyhow need greater area on the ground, also in 4 storey buildings.

TABLE 4: Differential costs of Dwellings According to Variation of Densities and Height of Buildings

Density (Dwellings per dunam)	Height of Buildings (Storeys)	Cost (1,000 IL)	Index
18.7	8	163	94.8
17.7	12	172	100.0
17.7	4	152	88.4
16.0	4	155	90.1
13.6	4	158	91.9
11.0	4/8/12	165	95.9
10.0	4	172	100.0
9.4	3	171	99.4
7.7	2	176	102.3
6.1	2	185	107.6
5.0	1	205	119.2
4.3	1	213	123.8
3.8	2	209	121.5
3.2	1	231	134.3
2.5	1	251	145.9

### CONCLUSIONS

Under given assumptions, low densities provide better environmental qualities, but their costs are higher. The cost of low-rise buildings (1-2 storeys) of the higher density range (say 6.1 - 7.7 dwellings/dunam) is only a little higher than the medium-low range of 4 storey buildings although their density related qualities are higher: more area on the ground (less dwellings per dunam, by density definition) and mainly for additional values of privacy and direct link with their private open space.

On the upper end of the recommended density ranges, four storey buildings, in the density ranges proposed, offer adequate environmental qualities at lowest costs and preferred to higher, say 8 - 12 storeys, buildings. These higher buildings would not allow even higher densities within the environmental constraints and user's requirements assumed in this study. Thus, their disadvantages (costs and of social and psychological nature) are greater than their advantages of absolute (but not relative) bigger spacing.

FOOTNOTES

1. The cost aspects were studied by Mrs. R. Friedman, Urban Economist & Planner.
2. Israel Builds, Ministry of Building and Housing, 1977.
3. As stated by D. Stern, former Chairman of the Israeli Builders Center.
4. A. Doudai, Proposals for Open Areas in residential plots - adopted by the National Council for Planning & Building in January, 1978.
5. 3.6 persons per family is the national average for urban areas; 5-6 persons per family was the Ministry of Housing's standard for 75 sq. m. dwellings. In sensibility tests the influence of variations of family size of dwellings was checked.
6. 1 dunam = 0.1 hectare.
7. R. Friedman: Costs for various quality groups in various densities and designs, October, 1977.
8. At higher land prices, say IL 500,000 or more, like in major cities, the cost differences between development of various densities increase significantly mainly for lower density ranges.

Page 198. The title of the article should read:

## **Designing for Human Behaviour: Some Performance Guidelines for the Design and Evaluation of Environmental Spaces in the Dwelling**

SOEN: New Trends in Urban Planning

This study is concerned with performance guidelines, from the point of view of the user, for the design and evaluation of environmental spaces in the dwelling. The point of departure is behavioural, based on an analysis of activities in the home. Within a given cultural and social frame of reference, we may generalize about the nature of these activities, yet at all times we must recognize the legitimate needs of those whose behaviour patterns diverge from these norms. When the general characteristics of a target population are defined in the broadest terms, and the individual users are unknown, the behavioural approach is confronted with the paradox of indeterminate functions. In the face of this paradox, we advocate an approach which reconciles standardization with variability. All activities in the home require appropriate physical environments. While these environments do not determine behaviour, they may facilitate or inhibit it, and when we consider the performance of an environment, it is therefore from the point of view of environment as a supportive framework of human behaviour.

In considering the performance of environmental spaces in the dwelling, we are concerned with two different aspects. We must examine the environmental conditions pertaining in each space: spatial conditions, storage and technical requirements, privacy conditions, environmental qualities of lighting, ventilation and acoustics, and so on. We also consider the organizational principles: hierarchical systems of environmental spaces, and the inter-relationship between component elements or sub-systems. While the organizational principles deal with the system as a whole, our analysis of environmental conditions tends to be specific, and generally does not consider the question of interaction between the various attributes. It is recognized that this is a shortcoming, for the study of such interactions is desirable. However, this desirable integration introduces a degree of complexity into the entire problem, which takes it beyond the scope of a limited study such as this. Consequently, the main thrust of this report is analytical rather than synthetic. We will argue later that the synthetic, or holistic, approach is that of the designer. These guidelines are intended to aid the designer, but not to replace him: the creative synthetic act remains his.

In determining the performance guidelines for environmental spaces - in terms of our principles of standardization and variability - our methodology has been based on the concepts of modularity (of both behaviour and space), hierarchical order, and flexibility. We start by classifying and structuring activities in the home in a five-level behavioural hierarchy: actions, activities, activity systems, dwelling functions, and dwelling patterns. We define the "dwelling process" as a changing set of dwelling patterns, over time. Of these levels, two are relevant to our study: activity systems, which are unified sets of activities, functionally and spatially related; and dwelling functions, which are complex behavioural systems comprising variable sets of activity systems. These are our behavioural modules, at two levels of the hierarchy.

Parallel with this, we have an environmental space hierarchy, relating to the two significant levels of behaviour. Hence we have activity zones (including sub-zones) at the activity system level, and functional spaces, at the dwelling function level. At the highest level of the hierarchy, we have generic plans as the spatial counterpart of the dwelling pattern. We define a "dynamic dwelling system" as an evolving set of generic plans, over time: the dynamic system is the end goal of the exercise. Generally - although there are some exceptions - the activity zone is significant as the level of definition of environmental conditions, while the functional space is the level of definition of organizational principles. An activity zone is the locus of a specific activity system: it consists of one or more sub-zones, each of which may comprise a core (specific to the sub-zone) and a field (which is an area of potential overlap). A functional space is the locus of a dwelling function, and comprises a variable set of activity zones: choice exists for the designer or user, in the composition of this set. Thus, while the behavioural and space modules tend to be standardized at the activity (space and module) level, there is choice and variability at the functional space level, with alternative permissible mixes of dominant, associated and optional activity systems, as we have defined them.

Performance requirements for activity zones include spatial requirements (minimum and desirable dimensions); storage requirements (location, design requirements and dimensions); privacy controls (visual, acoustic, access); technical requirements (equipment, services, heating); and environmental conditions (acoustic, daylighting). Performance requirements for functional spaces include preferred locations of activity zones; permissible connections with other functional spaces (horizontal, vertical, visual, acoustics); and environmental conditions, where these are relevant to functional space level (territory classification, privacy control, acoustic data, daylighting category, and ventilation).

Any approach seeking variability must be flexible and dynamic. Our study first takes a general look at the types of flexibility in dwellings, and suggests criteria for evaluation of performance. We then examine two specific and important problems: the adaptability of the dwelling to alternate life styles, and especially to the different dwelling preferences which these life styles generate (open or closed plan, linking of dining space to kitchen or living area, the provision of additional functional spaces such as outdoor space, etc); and the adaptability of the dwelling to the family cycle, by which we mean the maintenance of congruity between dwelling form and dwelling need in changing circumstances and over extended time-scales, through a succession of family profiles.

The immediate purpose of this report is to define environmental conditions for activity zones so that they will be supportive environments for human behaviour; and to establish organizational principles and procedures for combining zones into functional spaces, and for connecting these spaces into generic plans and dynamic systems. But these are abstractions. It is the function of the designer to transmute these abstractions into substance, by concretizing these abstract spaces (thus defined and organized) into the experiential reality of architectural space, in all its functional, aesthetic and symbolic dimensions. Hence he designs rooms (the physical enclosure of one or more functional spaces), dwelling plans (the unique organization of rooms), and eventually flexible dwellings (or plans designed to provide for adaptation and change over time). In the task of creating the concrete reality of architecture, these performance guidelines are a tool, an aid to design and a method of assessment and evaluation. They are not a substitute for the architect's creative talent and professional skill. Moreover, as the guidelines are neither infallibly authoritative or fully comprehensive, as they cannot foresee every contingency or anticipate every creative possibility, their use is not automatic: they must be interpreted by the architect, using his control mechanisms of professional experience and common sense.

We believe that the method of analysis established in this report is valid, in helping to enhance dwelling performance. It is especially effective because it is based on the activities of man, and puts man back where he belongs, in the centre of the stage. It is the philosophy of our approach that dwelling must be responsive to the needs and desires, the reasonable aspirations and the realizable dreams, of the user. From this point of view, it may be argued that many design decisions may perhaps more effectively be made, not by the professional designer at the initial design stage, but subsequently, by the user himself. The guidelines we propose, and particularly the organizational principles, create a framework which facilitates these later decisions, by offering structured choices between environmentally valid alternatives.

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\*Prof. Gilbert Herbert was assisted in this research by Archs. Avraham Keren and Yehuda Kalay.

SUMMARY SHEETS: FUNCTIONAL SPACES

ENTRANCE HALL				FUNCTIONAL SPACE NO.													
				<b>1</b>													
CONSTITUENT ACTIVITY ZONES (See table 2/3)				PERMISSIBLE CONNECTIONS WITH OTHER FUNCTIONAL SPACES (See table 5/2)													
	DOMINANT	RECOMMENDED ASSOC.	ALTERNATIVE ASSOC.	OPTIONAL	(table 3/3)(4/2)												
					Highly Recommended	HORIZONTAL					VERTICAL			VISUAL		ACOUSTIC	
					HO. SAME ROOM	H1. ADJACENT-OPEN	H2. ADJACENT-CLOSED	H3. CLOSE LINKED	H4. OPEN LINKED	H5. REMOTE	V1. SAME LEVEL	V2. HALF LEVEL	V3. FULL LEVEL	OPEN	OPEN, CONTROLLED	MIN. NOISE REDUCTION LEVEL OF PARTITION	
1.1 ENTRY, EXIT	X			a. TELEPHONE CONVERSATION	X	1. ENTRANCE HALL											
1.2 FREE TRANSIT		X		b. BABY: SLEEPING		2. BATHROOM											30
2.1 ABLUTIONS				c. BABY: PLAYPEN		3. TOILET							0	0			30
3.1 BODY FUNCTIONS				d. GUEST: SLEEPING		4. DOUBLE BED SPACE		0									25
4.1 SLEEPING: COUPLE				e. FORMAL DINING		5. SINGLE BED SPACE		0									35
4.2 CLOTHES STORAGE: COUPLE				f. CARDS, TABLE GAMES		6. UTILITY SPACE		0									15
4.3 TOILETTE				g. PARTIES, DANCING		7. KITCHEN		0									15
4.4 DESKWORK				h. SLIDES, MOVIES		8. DINING AREA	0		0								10
5.1 SLEEPING: SINGLE				i. PROFESSIONAL OCCUPATION		9. LIVING AREA	0		0								20
5.2 CLOTHES STORAGE: SINGLE				j. HANDWORK, CRAFTS		10. FAMILY ROOM											
5.3 PLAY/ RECREATION				k. MUSIC, PIANO		11. OUTDOOR SPACE											
5.4 STUDY				l. MUSIC, SMALL INSTRUMENTS		ENVIRONMENTAL CONDITIONS : REQUIREMENTS AT FUNCTIONAL SPACE LEVEL											
6.1 MACHINE LAUNDRY				m. MACHINE SEWING		PRIVACY CONTROL (Table 3/5)	VISUAL PRIVACY (TO PUBLIC DOMAIN)		Essential							0	
6.2 HAND LAUNDRY				n. MACHINE DRYING		ACQUSTIC DATA (Table 4/1)	ACOUSTIC PRIVACY (TO EXTERIOR)		Desirable							0	
6.3 CLOTHES DRYING				o. EXERCISES			HIGH DEGREE OF ACOUSTIC PRIVACY									-	
6.4 IRONING				p. PRAYERS		DAYLIGHT (Table 4/7)	AVE NOISE LEVEL GENERATED		L Ave							65	
6.5 HOUSEHOLD MAINTENANCE				q. SUCCA			AVE LEVEL DURING QUIET ACTIVITY (BACKGROUND)		L s							55	
6.6 BULK STORAGE				r. PET CARE			MAX. PERMISSIBLE NOISE LEVEL		L o							60	
7.1 FOOD PREPARATION				s. CAR STORAGE		VENTILATION (Chapter 4/3.4)	SPECIAL VENT. REQUIREMENTS		Vent to outside		Artificial vent OK					0	
7.2 LIGHT MEALS				t. GARDENING		SUNLIGHT (Table 4/7)	SUNLIGHT CATEGORY		GRADES 1-3							1	
8.1 FAMILY DINING				u. PERSONAL T.V.		TERRITORY CLASSIFICATION (Table 5/1)	PRIVATE										
9.1 ENTERTAINING GUESTS							SEMI-PRIVATE										
9.2 CROUP T.V.							SEMI-PUBLIC									X	
9.3 FAMILY LEISURE																	

BATHROOM

FUNCTIONAL SPACE NO.

2

CONSTITUENT ACTIVITY ZONES (See table 2/3)				PERMISSIBLE CONNECTIONS WITH OTHER FUNCTIONAL SPACES (See table 5/2) (table 3/3)(4/2)													
	DOMINANT	RECOMMENDED ASSOC.	ALTERNATIVE ASSOC.	OPTIONAL	PERMISSIBLE CONNECTIONS WITH OTHER FUNCTIONAL SPACES												
					Highly Recommended	HORIZONTAL					VERTICAL	VISUAL	ACOUSTIC				
					HO. SAME ROOM	H1. ADJACENT-OPEN	H2. ADJACENT-CLOSED	H3. CLOSE LINKED	H4. OPEN LINKED	H5. REMOTE	V1. SAME LEVEL	V2. HALF LEVEL	V3. FULL LEVEL	OPEN	OPEN, CONTROLLED	MIN. NOISE REDUCTION LEVEL OF PARTITION	
1.1 ENTRY, EXIT																	
1.2 FREE TRANSIT			X														
2.1 ABLUTIONS	X																
3.1 BODY FUNCTIONS																	
4.1 SLEEPING: COUPLE																	
4.2 CLOTHES STORAGE: COUPLE																	
4.3 TOILETTE																	
4.4 DESKWORK																	
5.1 SLEEPING: SINGLE																	
5.2 CLOTHES STORAGE: SINGLE																	
5.3 PLAY/ RECREATION																	
5.4 STUDY																	
6.1 MACHINE LAUNDRY																	
6.2 HAND LAUNDRY			X														
6.3 CLOTHES DRYING				X													
6.4 IRONING																	
6.5 HOUSEHOLD MAINTENANCE																	
6.6 BULK STORAGE																	
7.1 FOOD PREPARATION																	
7.2 LIGHT MEALS																	
8.1 FAMILY DINING																	
9.1 ENTERTAINING GUESTS																	
9.2 GROUP T.V.																	
9.3 FAMILY LEISURE																	
ENVIRONMENTAL CONDITIONS : REQUIREMENTS AT FUNCTIONAL SPACE LEVEL																	
PRIVACY CONTROL (Table 3/5) (Table 4/1)					VISUAL PRIVACY (TO PUBLIC DOMAIN)					Essential					0		
					ACOUSTIC PRIVACY (TO EXTERIOR)					Desirable					0		
					HIGH DEGREE OF ACOUSTIC PRIVACY										X		
ACOUSTIC DATA (Table 4/1)					AVE NOISE LEVEL GENERATED					L Ave					75		
					AVE LEVEL DURING QUIET ACTIVITY (BACKGROUND)					L s					60		
					MAX. PERMISSIBLE NOISE LEVEL					L o					-		
DAYLIGHT (Table 4/7)					DAYLIGHTING CATEGORY					GRADES 0-3					1		
VENTILATION (Chapter 4/3.4)					SPECIAL VENT. REQUIREMENTS					0 Vent to outside 0 Artificial vent OK					0		
SUNLIGHT (Table 4/7)					SUNLIGHT CATEGORY					GRADES 1-3					1		
TERRITORY CLASSIFICATION (Table 5/1)					PRIVATE										X		
					SEMI-PRIVATE												
					SEMI-PUBLIC												

TOILET				FUNCTIONAL SPACE NO. <b>3</b>												
CONSTITUENT ACTIVITY ZONES (See table 2/3)				PERMISSIBLE CONNECTIONS WITH OTHER FUNCTIONAL SPACES (See table 5/2) (table 3/3)(4/2)												
	DOMINANT	RECOMMENDED ASSOC.	ALTERNATIVE ASSOC.	OPTIONAL	● Highly Recommended ⊕ Recommended 0 Possible, not recommended											
					HORIZONTAL					VERTICAL			VISUAL		ACOUSTIC	
					H0-SAME ROOM	H1-ADJACENT-OPEN	H2-ADJACENT-CLOSED	H3-CLOSE LINKED	H4-OPEN LINKED	H5-REMOTE	V1-SAME LEVEL	V2-HALF LEVEL	V3-FULL LEVEL	OPEN	OPEN, CONTROLLED	MIN. NOISE REDUCTION LEVEL OF PARTITION
1.1 ENTRY, EXIT	X		a. TELEPHONE CONVERSATION	1. ENTRANCE HALL			●	⊕	⊕	●	0	0	-	-	30	
1.2 FREE TRANSIT		2. BATHROOM	⊕	●	0	●				●				-	-	25
2.1 ABLUTIONS		3. TOILET														
3.1 BODY FUNCTIONS		4. DOUBLE BED SPACE		b. BABY: SLEEPING				●			●	0		-	-	35
4.1 SLEEPING: COUPLE		5. SINGLE BED SPACE		c. BABY: PLAYPEN				●			●	0		-	-	35
4.2 CLOTHES STORAGE: COUPLE		6. UTILITY SPACE		d. GUEST: SLEEPING			⊕	●	0	●	●	●	●	-	-	25
4.3 TOILETTE		7. KITCHEN		e. FORMAL DINING				●	0	●	●	●	●	-	-	25
4.4 DESKWORK		8. DINING AREA		f. CARDS, TABLE GAMES				●	0	⊕	●	●	●	-	-	25
5.1 SLEEPING: SINGLE		9. LIVING AREA		g. PARTIES, DANCING				0	0	⊕	●	●	●	-	-	35
5.2 CLOTHES STORAGE: SINGLE		10. FAMILY ROOM		h. SLIDES, MOVIES				⊕	●	●	⊕	●	0			
5.3 PLAY/ RECREATION		11. OUTDOOR SPACE		i. PROFESSIONAL OCCUPATION	ENVIRONMENTAL CONDITIONS : REQUIREMENTS AT FUNCTIONAL SPACE LEVEL											
5.4 STUDY				j. HANDWORK, CRAFTS	PRIVACY CONTROL (Table 3/5)	VISUAL PRIVACY (TO PUBLIC DOMAIN)		● Essential								●
6.1 MACHINE LAUNDRY				k. MUSIC, PIANO	(Table 4/1)	ACOUSTIC PRIVACY (TO EXTERIOR)		0 Desirable								●
6.2 HAND LAUNDRY				l. MUSIC, SMALL INSTRUMENTS		HIGH DEGREE OF ACOUSTIC PRIVACY										X
6.3 CLOTHES DRYING				m. MACHINE SEWING	ACOUSTIC DATA (Table 4/1)	AVE NOISE LEVEL GENERATED		L Ave								75
6.4 IRONING			n. MACHINE DRYING		AVE LEVEL DURING QUIET ACTIVITY (BACKGROUND)		L s								60	
6.5 HOUSEHOLD MAINTENANCE			o. EXERCISES		MAX. PERMISSIBLE NOISE LEVEL		L o									
6.6 BULK STORAGE			p. PRAYERS	DAYLIGHT (Table 4/7)	DAYLIGHTING CATEGORY		GRADES 0-3								1	
7.1 FOOD PREPARATION			q. SUCCAH	VENTILATION (Chapter 4/3.4)	SPECIAL VENT. REQUIREMENTS		● Vent to outside 0 Artificial vent OK								0	
7.2 LIGHT MEALS			r. PET CARE	SUNLIGHT (Table 4/7)	SUNLIGHT CATEGORY		GRADES 1-3								1	
8.1 FAMILY DINING			s. CAR STORAGE	TERRITORY CLASSIFICATION (Table 5/1)	PRIVATE											
9.1 ENTERTAINING GUESTS			t. GARDENING		SEMI-PRIVATE										X	
9.2 GROUP T.V.			u. PERSONAL T.V.		SEMI-PUBLIC											
9.3 FAMILY LEISURE																



DOUBLE BED SPACE				FUNCTIONAL SPACE NO. <b>4</b>												
CONSTITUENT ACTIVITY ZONES (See table 2/3)				PERMISSIBLE CONNECTIONS WITH OTHER FUNCTIONAL SPACES (See table 5/2) (table 3/3)(4/2)												
	DOMINANT	RECOMMENDED ASSOC.	ALTERNATIVE ASSOC.	OPTIONAL	● Highly Recommended ⊕ Recommended 0 Possible, not recommended											
					HORIZONTAL					VERTICAL			VISUAL		ACOUSTIC	
					H0. SAME ROOM	H1. ADJACENT-OPEN	H2. ADJACENT-CLOSED	H3. CLOSE LINKED	H4. OPEN LINKED	H5. REMOTE	V1. SAME LEVEL	V2. HALF LEVEL	V3. FULL LEVEL	OPEN	OPEN, CONTROLLED	MIN. NOISE REDUCTION LEVEL OF PARTITION
1.1 ENTRY, EXIT				X	1. ENTRANCE HALL		0	⊕	⊕	●	●	●				25
1.2 FREE TRANSIT			X		2. BATHROOM			●			0	0				35
2.1 ABLUTIONS				X	3. TOILET			●			0	0				35
3.1 BODY FUNCTIONS				X	4. DOUBLE BED SPACE											
4.1 SLEEPING: COUPLE	X				5. SINGLE BED SPACE			●	0	⊕	●	0	0			40
4.2 CLOTHES STORAGE: COUPLE		X			6. UTILITY SPACE			●	0	●	●	●	●			35
4.3 TOILETTE		X			7. KITCHEN			●	0	●	●	●	●			35
4.4 DESKWORK		X			8. DINING AREA		0	●	0	●	●	●	●			30
5.1 SLEEPING: SINGLE					9. LIVING AREA		0	●	⊕	●	●	●	●			40
5.2 CLOTHES STORAGE: SINGLE					10. FAMILY ROOM			●	●	●	●	●	●			
5.3 PLAY/ RECREATION					11. OUTDOOR SPACE			●	●	●	●	●	●			
5.4 STUDY					ENVIRONMENTAL CONDITIONS : REQUIREMENTS AT FUNCTIONAL SPACE LEVEL											
6.1 MACHINE LAUNDRY				X	PRIVACY CONTROL (Table 3/5) ACOUSTIC PRIVACY (Table 4/1)	VISUAL PRIVACY (TO PUBLIC DOMAIN)		● Essential			●					
6.2 HAND LAUNDRY				X		ACOUSTIC PRIVACY (TO EXTERIOR)		0 Desirable			●					
6.3 CLOTHES DRYING				X	ACOUSTIC DATA (Table 4/1)	HIGH DEGREE OF ACOUSTIC PRIVACY					X					
6.4 IRONING				X		AVE NOISE LEVEL GENERATED		L Ave			70					
6.5 HOUSEHOLD MAINTENANCE				X		AVE LEVEL DURING QUIET ACTIVITY (BACKGROUND)		L o			50					
6.6 BULK STORAGE				X	MAX. PERMISSIBLE NOISE LEVEL		L o			40						
7.1 FOOD PREPARATION				X	DAYLIGHT (Table 4/7)	DAYLIGHTING CATEGORY		GRADES 0-3			3					
7.2 LIGHT MEALS				X	VENTILATION (Chapter 4/3.4)	SPECIAL VENT. REQUIREMENTS		● Vent to outside 0 Artificial vent OK			●					
8.1 FAMILY DINING				X	SUNLIGHT (Table 4/7)	SUNLIGHT CATEGORY		GRADES 1-3			3					
9.1 ENTERTAINING GUESTS				X	TERRITORY CLASSIFICATION (Table 5/1)	PRIVATE										
9.2 GROUP T.V.				X		SEMI-PRIVATE										
9.3 FAMILY LEISURE				X		SEMI-PUBLIC										

SINGLE BED SPACE				FUNCTIONAL SPACE NO. <b>5</b>												
CONSTITUENT ACTIVITY ZONES (See table 2/3)				PERMISSIBLE CONNECTIONS WITH OTHER FUNCTIONAL SPACES (See table 5/2) (table 3/3)(4/2)												
	DOMINANT	RECOMMENDED ASSOC.	ALTERNATIVE ASSOC.	OPTIONAL	● Highly Recommended ⊕ Recommended 0 Possible, not recommended											
					HORIZONTAL					VERTICAL			VISUAL		ACOUSTIC	
					H0-SAME ROOM	H1-ADJACENT-OPEN	H2-ADJACENT-CLOSED	H3-CLOSE LINKED	H4-OPEN LINKED	H5-REMOTE	V1-SAME LEVEL	V2-HALF LEVEL	V3-FULL LEVEL	OPEN	OPEN, CONTROLLED	MIN. NOISE REDUCTION LEVEL OF PARTITION
1.1 ENTRY, EXIT					1. ENTRANCE HALL		0	0	⊕	⊕	0	0	0			35
1.2 FREE TRANSIT			X		2. BATHROOM			0			0	0				35
2.1 ABLUTIONS				X	3. TOILET			0			0	0				35
3.1 BODY FUNCTIONS				X	4. DOUBLE BED SPACE			0	0	⊕	0	0	0			40
4.1 SLEEPING: COUPLE				X	5. SINGLE BED SPACE											
4.2 CLOTHES STORAGE: COUPLE					6. UTILITY SPACE			0	0	0	0	0	0			35
4.3 TOILETTE					7. KITCHEN			0	0	0	0	0	0			35
4.4 DESKWORK					8. DINING AREA		0	0	0	0	0	0	0			30
5.1 SLEEPING: SINGLE	X				9. LIVING AREA			0	0	0	0	0	0			40
5.2 CLOTHES STORAGE: SINGLE		X			10. FAMILY ROOM		0	0	0	⊕	⊕	0	0			40
5.3 PLAY/ RECREATION		X		X	11. OUTDOOR SPACE			0	0	0	0	0	0			
5.4 STUDY		X			ENVIRONMENTAL CONDITIONS : REQUIREMENTS AT FUNCTIONAL SPACE LEVEL											
6.1 MACHINE LAUNDRY				X	PRIVACY CONTROL (Table 3/5) (Table 4/1)	VISUAL PRIVACY (TO PUBLIC DOMAIN)		● Essential			0					
6.2 HAND LAUNDRY				X		ACOUSTIC PRIVACY (TO EXTERIOR)		0 Desirable			0					
6.3 CLOTHES DRYING				X		HIGH DEGREE OF ACOUSTIC PRIVACY					X					
6.4 IRONING				X	ACOUSTIC DATA (Table 4/1)	AVE NOISE LEVEL GENERATED		L Ave			80					
6.5 HOUSEHOLD MAINTENANCE				X		AVE LEVEL DURING QUIET ACTIVITY (BACKGROUND)		L e			50					
6.6 BULK STORAGE				X		MAX. PERMISSIBLE NOISE LEVEL		L o			40					
7.1 FOOD PREPARATION				X	DAYLIGHT (Table 4/7)	DAYLIGHTING CATEGORY		GRADES 0-3			3					
7.2 LIGHT MEALS				X	VENTILATION (Chapter 4/3.4)	SPECIAL VENT. REQUIREMENTS		● Vent to outside 0 Artificial vent OK			0					
8.1 FAMILY DINING				X	SUNLIGHT (Table 4/7)	SUNLIGHT CATEGORY		GRADES 1-3			3					
9.1 ENTERTAINING GUESTS				X	TERRITORY CLASSIFICATION (Table 5/1)	PRIVATE										
9.2 GROUP T.V.				X		SEMI-PRIVATE										
9.3 FAMILY LEISURE				X		SEMI-PUBLIC										

UTILITY SPACE				FUNCTIONAL SPACE NO. <b>6</b>													
CONSTITUENT ACTIVITY ZONES (See table 2/3)				PERMISSIBLE CONNECTIONS WITH OTHER FUNCTIONAL SPACES (See table 5/2)													
	DOMINANT	RECOMMENDED ASSOC.	ALTERNATIVE ASSOC.	OPTIONAL	(table 3/3) (4/2)												
					● Highly Recommended	HORIZONTAL					VERTICAL			VISUAL	ACOUSTIC		
					○ Recommended	H0. SAME ROOM	H1. ADJACENT-OPEN	H2. ADJACENT-CLOSED	H3. CLOSE LINKED	H4. OPEN LINKED	H5. REMOTE	V1. SAME LEVEL	V2. HALF LEVEL	V3. FULL LEVEL	OPEN	OPEN, CONTROLLED	MIN. NOISE REDUCTION LEVEL OF PARTITION
					○ Possible, not recommended												
1.1 ENTRY, EXIT								○	○	○	○	○	○	○			15
1.2 FREE TRANSIT			X			○	○	○	○	○	○	○	○	○			-
2.1 WASHINGS								○	○	○	○	○	○	○			25
3.1 BODY FUNCTIONS								○	○	○	○	○	○	○			35
4.1 SLEEPING: COUPLE								○	○	○	○	○	○	○			35
4.2 CLOTHES STORAGE: COUPLE																	
4.3 TOILETTE						○	○	○	○	○	○	○	○	○	○	○	35
4.4 DESKWORK								○	○	○	○	○	○	○			30
5.1 SLEEPING: SINGLE								○	○	○	○	○	○	○			40
5.2 CLOTHES STORAGE: SINGLE																	
5.3 PLAY/RECREATION																	
5.4 STUDY																	
6.1 MACHINE LAUNDRY	X																
6.2 HAND LAUNDRY		X															
6.3 CLOTHES DRYING			X														
6.4 IRONING																	
6.5 HOUSEHOLD MAINTENANCE																	
6.6 BULK STORAGE																	
7.1 FOOD PREPARATION																	
7.2 LIGHT MEALS																	
8.1 FAMILY DINING																	
9.1 ENTERTAINING GUESTS																	
9.2 GROUP T.V.																	
9.3 FAMILY LEISURE																	
ENVIRONMENTAL CONDITIONS : REQUIREMENTS AT FUNCTIONAL SPACE LEVEL																	
PRIVACY CONTROL (Table 3/5; Table 4/1)					VISUAL PRIVACY (TO PUBLIC DOMAIN)			ACOUSTIC PRIVACY (TO EXTERIOR)			HIGH DEGREE OF ACOUSTIC PRIVACY			Essential		Desirable	
					L Ave			L s			L o			0		0	
					AVE NOISE LEVEL GENERATED			AVE LEVEL DURING QUIET ACTIVITY (BACKGROUND)			MAX. PERMISSIBLE NOISE LEVEL			75		-	
					DAYLIGHT (Table 4/7)			DAYLIGHTING CATEGORY			GRADES 0-3			1			
					VENTILATION (Chapter 4/3.4)			SPECIAL VENT. REQUIREMENTS			Vent to outside			0 Artificial vent OK		0	
					SUNLIGHT (Table 4/7)			SUNLIGHT CATEGORY			GRADES 1-3			2			
					TERRITORY CLASSIFICATION (table 5/1)			PRIVATE									
								SEMI-PRIVATE									
								SEMI-PUBLIC								X	

KITCHEN					FUNCTIONAL SPACE NO.											
					7											
CONSTITUENT ACTIVITY ZONES (See table 2/3)				PERMISSIBLE CONNECTIONS WITH OTHER FUNCTIONAL SPACES (See table 5/2)						(table 3/3)(4/2)						
	DOMINANT	RECOMMENDED ASSOC.	ALTERNATIVE ASSOC.	OPTIONAL	● Highly Recommended ○ Recommended ◊ Possible, not recommended	HORIZONTAL					VERTICAL	VISUAL	ACOUSTIC			
						H0. SAME ROOM	H1. ADJACENT-OPEN	H2. ADJACENT-CLOSED	H3. CLOSE LINKED	H4. OPEN LINKED	H5. REMOTE	V1. SAME LEVEL	V2. HALF LEVEL	V3. FULL LEVEL	OPEN	OPEN, CONTROLLED
1.1 ENTRY, EXIT				X	1. ENTRANCE: HALL	○	●	○	○		●	○	○	-	-	15
1.2 FREE TRANSIT			X		2. BATHROOM			○	●	○	●	●	●	-	-	25
2.1 ABLUTIONS					3. TOILET				●	○	●	●	●	-	-	25
3.1 BODY FUNCTIONS				X	4. DOUBLE BED SPACE				●	○	●	●	●	-	-	35
4.1 SLEEPING: COUPLE					5. SINGLE BED SPACE				●	○	●	●	●	-	-	35
4.2 CLOTHES STORAGE: COUPLE					6. UTILITY SPACE	○	●	○	○	○	○	○	○	○	○	15
4.3 TOILETTE					7. KITCHEN	○	●	○	○	○	○	○	○	○	○	15
4.4 DESKWORK					8. DINING AREA	○	●	○	○	○	○	○	○	○	○	15
5.1 SLEEPING: SINGLE					9. LIVING AREA		●	●	●	●	○	○	○	-	○	25
5.2 CLOTHES STORAGE: SINGLE					10. FAMILY ROOM	○	●	○	○	○	○	○	○	○	○	15
5.3 PLAY/ RECREATION				X	11. OUTDOOR SPACE		●	●	●	●	●	●	●	-	-	15
5.4 STUDY					ENVIRONMENTAL CONDITIONS : REQUIREMENTS AT FUNCTIONAL SPACE LEVEL											
6.1 MACHINE LAUNDRY					PRIVACY CONTROL (Table 3/5) (Table 4/1)	VISUAL PRIVACY (TO PUBLIC DOMAIN)		ACOUSTIC PRIVACY (TO EXTERIOR)		HIGH DEGREE OF ACOUSTIC PRIVACY		Essential		Desirable		0
6.2 HAND LAUNDRY						AVE NOISE LEVEL GENERATED		AVE LEVEL DURING QUIET ACTIVITY (BACKGROUND)		MAX. PERMISSIBLE NOISE LEVEL		L Ave		L s		75
6.3 CLOTHES DRYING			X			DAYLIGHT (Table 4/7)		DAYLIGHTING CATEGORY		VENTILATION (Chapter 4/3.4)		SPECIAL VENT. REQUIREMENTS		SUNLIGHT CATEGORY		60
6.4 IRONING			X			SUNLIGHT (Table 4/7)		SUNLIGHT CATEGORY		TERRITORY CLASSIFICATION (Table 5/1)		PRIVATE		SEMI-PRIVATE		60
6.5 HOUSEHOLD MAINTENANCE			X			DAYLIGHT (Table 4/7)		DAYLIGHTING CATEGORY		TERRITORY CLASSIFICATION (Table 5/1)		SEMI-PRIVATE		SEMI-PUBLIC		3
6.6 BULK STORAGE						SUNLIGHT (Table 4/7)		SUNLIGHT CATEGORY		TERRITORY CLASSIFICATION (Table 5/1)		SEMI-PRIVATE		SEMI-PUBLIC		2
7.1 FOOD PREPARATION	X					SUNLIGHT (Table 4/7)		SUNLIGHT CATEGORY		TERRITORY CLASSIFICATION (Table 5/1)		SEMI-PRIVATE		SEMI-PUBLIC		2
7.2 LIGHT MEALS		X				SUNLIGHT (Table 4/7)		SUNLIGHT CATEGORY		TERRITORY CLASSIFICATION (Table 5/1)		SEMI-PRIVATE		SEMI-PUBLIC		2
8.1 FAMILY DINING				X		SUNLIGHT (Table 4/7)		SUNLIGHT CATEGORY		TERRITORY CLASSIFICATION (Table 5/1)		SEMI-PRIVATE		SEMI-PUBLIC		2
9.1 ENTERTAINING GUESTS						SUNLIGHT (Table 4/7)		SUNLIGHT CATEGORY		TERRITORY CLASSIFICATION (Table 5/1)		SEMI-PRIVATE		SEMI-PUBLIC		2
9.2 GROUP T.V.						SUNLIGHT (Table 4/7)		SUNLIGHT CATEGORY		TERRITORY CLASSIFICATION (Table 5/1)		SEMI-PRIVATE		SEMI-PUBLIC		2
9.3 FAMILY LEISURE						SUNLIGHT (Table 4/7)		SUNLIGHT CATEGORY		TERRITORY CLASSIFICATION (Table 5/1)		SEMI-PRIVATE		SEMI-PUBLIC		2

DINING AREA

FUNCTIONAL SPACE NO.

8

CONSTITUENT ACTIVITY ZONES (See table 2/3)				PERMISSIBLE CONNECTIONS WITH OTHER FUNCTIONAL SPACES (See table 5/2)												
DOMINANT	RECOMMENDED ASSOC.	ALTERNATIVE ASSOC.	OPTIONAL	(table 3/3)(4/2)												
				● Highly Recommended					HORIZONTAL			VERTICAL		VISUAL		ACOUSTIC
⊕ Recommended				B0. SAME ROOM	B1. ADJACENT-OPEN	B2. ADJACENT-CLOSED	B3. CLOSE LINKED	B4. OPEN LINKED	B5. REMOTE	V1. SAME LEVEL	V2. HALF LEVEL	V3. FULL LEVEL	OPEN	OPEN, CONTROLLED	MIN. NOISE REDUCTION LEVEL OF PARTITION	
○ Possible, not recommended																
1.1 ENTRY, EXIT			a. TELEPHONE CONVERSATION	X	1. ENTRANCE HALL	0	●	●	○	○	●	●	○	-	-	10
1.2 FREE TRANSIT		X	b. BABY: SLEEPING		2. BATHROOM			○	●	○	●	●	○	-	-	25
2.1 ABLUTIONS			c. BABY: PLAYPEN	X	3. TOILET			●	○	○	●	●	○	-	-	25
3.1 BODY FUNCTIONS			d. GUEST: SLEEPING	X	4. DOUBLE BED SPACE			○	●	○	●	●	○	-	-	30
4.1 SLEEPING: COUPLE			e. FORMAL DINING	X	5. SINGLE BED SPACE			○	●	○	●	●	○	-	-	30
4.2 CLOTHES STORAGE: COUPLE			f. CARDS, TABLE GAMES	X	6. UTILITY SPACE			○	●	○	●	●	○	-	-	15
4.3 TOILETTE			g. PARTIES, DANCING	X	7. KITCHEN	○	●	○	○	○	○	○	○	○	○	15
4.4 DESKWORK		X	h. SLIDES, MOVIES		8. DINING AREA	/	/	/	/	/	/	/	/	/	/	/
5.1 SLEEPING: SINGLE			i. PROFESSIONAL OCCUPATION	X	9. LIVING AREA	○	●	○	○	○	○	○	○	○	○	20
5.2 CLOTHES STORAGE: SINGLE		X	j. HANDWORK, CRAFTS	X	10. FAMILY ROOM	○	●	○	○	○	○	○	○	-	○	
5.3 PLAY/ RECREATION		X	k. MUSIC, PIANO	X	11. OUTDOOR SPACE	○	●	○	○	○	○	○	○	-	○	
5.4 STUDY		X	l. MUSIC, SMALL INSTRUMENTS	X	ENVIRONMENTAL CONDITIONS : REQUIREMENTS AT FUNCTIONAL SPACE LEVEL											
6.1 MACHINE LAUNDRY			m. MACHINE SEWING	X	ACQUSTIC DATA (Table 4/1)	PRIVACY CONTROL (Table 3/5)					VISUAL PRIVACY (TO PUBLIC DOMAIN)		● Essential		0	
6.2 HAND LAUNDRY			n. MACHINE DRYING	X		ACQUSTIC DATA (Table 4/1)					ACOUSTIC PRIVACY (TO EXTERIOR)		○ Desirable		0	
6.3 CLOTHES DRYING			o. EXERCISES	X		ACQUSTIC DATA (Table 4/1)					HIGH DEGREE OF ACOUSTIC PRIVACY				-	
6.4 IRONING			p. PRAYERS	X	DAYLIGHT (Table 4/7)	AVE NOISE LEVEL GENERATED					L Ave				70	
6.5 HOUSEHOLD MAINTENANCE			q. SUCCAH			AVE LEVEL DURING QUIET ACTIVITY (BACKGROUND)					L q				60	
6.6 BULK STORAGE			r. PFT CARE			MAX. PERMISSIBLE NOISE LEVEL					L o				60	
7.1 FOOD PREPARATION			s. CAR STOPAGE		VENTILATION (Chapter 4/3.4)	DAYLIGHTING CATEGORY					GRADES 0-3				2	
7.2 LIGHT MEALS			t. GARDENING			SPECIAL VENT. REQUIREMENTS					● Vent to outside		○ Artificial vent OK		○	
8.1 FAMILY DINING	X		u. PERSONAL T.V.		SUNLIGHT (Table 4/7)	SUNLIGHT CATEGORY					GRADES 1-3				2	
9.1 ENTERTAINING GUESTS		X				TERRITORY CLASSIFICATION (Table 5/1)	PRIVATE									
9.2 GROUP T.V.		X					SEMI-PRIVATE									
9.3 FAMILY LEISURE		X			SEMI-PUBLIC											

LIVING AREA					FUNCTIONAL SPACE NO.	
					<b>9</b>	
CONSTITUENT ACTIVITY ZONES (See table 2/3)				PERMISSIBLE CONNECTIONS WITH OTHER FUNCTIONAL SPACES (See table 5/2)		
	DOMINANT	RECOMMENDED ASSCC.	ALTERNATIVE ASSCC.	OPTIONAL	(table 3/3) (4/2)	
					FUNCTIONAL SPACES (See table 5/2)	
					* Highly Recommended * Recommended 0 Possible, not recommended	HORIZONTAL H0. SAME ROOM H1. ADJACENT-OPEN H2. ADJACENT-CLOSED H3. CLOSE LINKED H4. OPEN LINKED H5. REMOTE VERTICAL V1. SAME LEVEL V2. HALF LEVEL V3. FULL LEVEL OPEN OPEN, CONTROLLED MIN. NOISE REDUCTION LEVEL OF PARTITION
1.1 ENTRY, EXIT			a. TELEPHONE CONVERSATION	X	1. ENTRANCE HALL	0 ● ● 0 ● ● ● ● ● 0 - - 20
1.2 FREE TRANSIT			b. BABY: SLEEPING		2. BATHROOM	0 ● ● 0 ● ● ● ● ● 0 - - 35
2.1 ABLUTIONS			c. BABY: PLAYPEN	X	3. TOILET	0 ● ● 0 ● ● ● ● ● 0 - - 35
3.1 BODY FUNCTIONS			d. GUEST: SLEEPING	X	4. DOUBLE BED SPACE	0 ● ● 0 ● ● ● ● ● 0 - - 40
4.1 SLEEPING: COUPLE			e. FORMAL DINING	X	5. SINGLE BED SPACE	0 ● ● 0 ● ● ● ● ● 0 - - 40
4.2 CLOTHES STORAGE: COUPLE			f. CARDS, TABLE GAMES	X	6. UTILITY SPACE	0 ● ● 0 ● ● ● ● ● 0 - - 25
4.3 TOILETTE			g. PARTIES, DANCING	X	7. KITCHEN	● ● ● ● ● ● ● 0 - - 25
4.4 DESKWORK			h. SLIDES, MOVIES	X	8. DINING AREA	● ● ● 0 ● ● ● 0 - - 20
5.1 SLEEPING: SINGLE			i. PROFESSIONAL OCCUPATION	X	9. LIVING AREA	/// /// /// /// /// /// ///
5.2 CLOTHES STORAGE: SINGLE			j. HANDWORK, CRAFTS	X	10. FAMILY ROOM	● ● ● ● ● ● ● 0 - - 0
5.3 PLAY/RECREATION			k. MUSIC, PIANO	X	11. OUTDOOR SPACE	● ● ● ● ● ● ● 0 0 0 0
5.4 STUDY			l. MUSIC, SMALL INSTRUMENTS	X	ENVIRONMENTAL CONDITIONS : REQUIREMENTS AT FUNCTIONAL SPACE LEVEL	
6.1 MACHINE LAUNDRY			m. MACHINE SEWING	X	PRIVACY CONTROL (Table 3/5)	VISUAL PRIVACY (TO PUBLIC DOMAIN) ● Essential 0
6.2 HAND LAUNDRY			n. MACHINE DRYING	X	(Table 4/1)	ACOUSTIC PRIVACY (TO EXTERIOR) 0 Desirable 0
6.3 CLOTHES DRYING			o. EXERCISES	X		HIGH DEGREE OF ACOUSTIC PRIVACY -
6.4 IRONING			p. PRAYERS	X	ACOUSTIC DATA (Table 4/1)	Avg NOISE LEVEL GENERATED i. Avg 80
6.5 HOUSEHOLD MAINTENANCE			q. SUCCAH			Avg LEVEL DURING QUIET ACTIVITY (BACKGROUND) L 50
6.6 BULK STORAGE			r. PET CARE			MAX. PERMISSIBLE NOISE LEVEL L 0 50
7.1 FOOD PREPARATION			s. CAR STORAGE		DAYLIGHT (Table 4/7)	DAYLIGHTING CATEGORY GRADES 0-3 3
7.2 LIGHT MEALS			t. GARDENING		VENTILATION (Chapter 4/3.4)	SPECIAL VENT. REQUIREMENTS ● Vent to outside 0 Artificial vent OK 0
8.1 FAMILY DINING			u. PERSONAL T.V.		SUNLIGHT (Table 4/7)	SUNLIGHT CATEGORY GRADES 1-3 3
9.1 ENTERTAINING GUESTS	X				TERRITORY CLASSIFICATION (Table 5/1)	PRIVATE
9.2 GROUP T.V.		X				SEMI-PRIVATE
9.3 FAMILY LEISURE		X				SEMI-PUBLIC















SUMMARY OF PERFORMANCE REQUIREMENTS FOR DOMINANT AND ASSOCIATED ACTIVITY ZONES																										
ACTIVITY ZONES	GENERAL REQUIREMENTS				TECHNICAL REQUIREMENTS				ENVIRONMENTAL CONDITIONS				STORAGE REQUIREMENTS		SPATIAL REQUIREMENTS											
	PRIVACY CONTROLS		ACCESS CONTROLS		EQUIPMENT		SERVICES (in addition to power)		AVG. NOISE LEVEL		ACUSTIC DATA		DANLIGHT PERMISSIBLE		LOCATION		PROFILE									
NO.	FAMILY	VISITORS	PEOPLE OUTSIDE	PEOPLE INSIDE	FAMILY	VISITORS	PEOPLE OUTSIDE	PEOPLE INSIDE	AVG. NOISE LEVEL	BACKGROUND NOISE	AVG. NOISE LEVEL	REAR. NOISE LEVEL	DANLIGHT CATEGORY	STORAGE UNIT (CRITICAL ITEMS ONLY)	NON-CRITICAL STORAGE UNIT - SEE TABLE 3/7	WITHIN FUNCTIONAL SPACE	EXTERNAL BUT COMMENT TO FUNCTIONAL SPACE	MINIMUM VOLUME - M <sup>3</sup>	CONSTANT TO ALL PROFILES	RELEVANT ONLY TO LISTED PROFILES	MINIMUM AVERAGE HT. OF ACT. ZONE PORTION MAY BE BELOW MIN.	MINIMUM HEIGHT	MINIMUM AREA M <sup>2</sup>	MINIMUM HORIZONTAL DIMENSION - CM.	PROFILE	RELEVANT ONLY TO LISTED PROFILES
7.2	0	0	0	0	0	0	0	0	60	60	60	60	2	7.21 EATING AREA							210	1.7	110	•	2	
8.1	0	0	0	0	0	0	0	0	70	60	60	2		8.1A SIDEROAD	•	0	0.50	0.60	0.70	2	210	4.1	180	•	2	
9.1	0	0	0	0	0	0	0	0	80	60	60	3		9.1A ENTERTAINMENT UNIT	•	0	0.10		2	210	5.8	240	•	3,4		
9.2	0	0	0	0	0	0	0	0	80	70	60	1		9.11 SEATING ZONE (a)					2	210	7.2	240	•	5,6		
9.3	0	0	0	0	0	0	0	0	70	50	50	3		9.12 ENTERTAINMENT UNIT	•				2	210	3.7	110	•	2		
														9.21 VIEWING ZONE							210	4.0	200	•	3,6	
														9.31 SHATING							210	4.0	200	•	3,6	
														9.32 BOOKCASE							210	4.0	200	•	3,6	

# New Attitudes to Social Indicators in the Evaluation of "Quality of Life"

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A relatively new component in today's policymakers' deliberations is the need to take into account, more than in the past, economic and physical factors, range of social, cultural, psychological and ethical considerations. As will be shown, this issue is going to affect not only a select group of policymakers in central governments, but a much wider range of public servants, professionals, executives, engaged in various areas of activity by which urban and regional planning are obviously among the most affected.

The issues of definition of the new "Quality of Life" indicators can be roughly classified into two groups:

- (a) Essentials: namely, what could and should the indicators be; areas of concern, standards, validity of the indicators, and so on.
- (b) Policymaking: namely, how to translate the general concepts into operational objectives, leading to factual changes in individual and societal behaviour. In this context, the means acquire no less weight than the ends, and the ideal system must often be replaced by a feasible one.

Nowadays, the policymakers have to keep very much in mind a general and lasting concern: to avoid as much as possible increasing the scope of their responsibility, the weight of importance and, in a word, the total volume of government involvement, which is growing all over the western world. As a simple illustration, in Israel the government budget is approaching the size of the National Income. Our concern should then be: how, then, are we going to charge the policymakers with an additional responsibility of involvement in issues of quality of life legislation, persuasion and so, without, at the same time, increasing the volume of government interference and responsibility?

Now, turning to our issue: why did the question of new "Quality of Life" indicators become more urgent now than before? Historically, it has its roots in the period following the Second World War.

The Universal Declaration of Human Rights, adopted by the UN in 1948, included social security, an adequate standard of living, health, well-being and education, among the rights to which everyone is entitled. In 1954 a report on "International Definition and Measurements of Standards and Levels of Living", prepared by U.N., included a list of 12 components of the level of living: health, food, education, conditions of work, employment situation, consumption and savings, transportation, housing, clothing, recreation and entertainment, social security, human freedoms.

Some of the implications and difficulties in trying to establish even the simplest

definitions, standards and measurements of these components will be discussed further on.

In the fifties and sixties major emphasis was still placed on "growth", and the GNP, or National Income, were the ruling indices of development ("growthism"). The strategy for the Second Decade of Development, adopted by the U.N. in 1970, already stressed the unified approach, viewing economic and social development as one process, with equal emphasis on a variety of components.

The seventies witnessed a major change in the attitude to economic growth. It started with a series of economic crises in the west, inflation, stagflation, unemployment, together with the growing awareness of an impending danger of uncontrolled utilization of raw materials and concomitant ecological deterioration. At the same time, problems of the Third World substantially increased, mainly population growth, rapid urbanization and unemployment, undernourishment, starvation, poverty and misery affecting hundreds of millions, contrasting severely with the situation in some of the western countries. All these developments preceded the 1973 October War.

The apocalyptic first report of the Club of Rome, was published a year earlier. Among the explosive situations it omitted the "explosion of information", which, although only of a secondary and perhaps even a marginal dimension, contributed massively towards the formulation of "revolution of rising expectations" and "rising entitlements". In the era of the all-penetrating mass-media, connecting all the corners of the world, situations of plenty in one place and of absolute poverty in another, cannot co-exist peacefully for a lengthy period. On top of these changes occurred the war of 1973, with its overwhelming political and economic consequences on global scale.

The 1974 resolution of U.N. on New International Economic Order gave an impetus to the search for new directions in establishing indicators of Development, Growth and Progress.

Reference will now be made to three different current attempts to establish indicators of quality of life, development and progress, and the areas of their convergence and divergence will be indicated.

A major comprehensive, empirical effort was launched in 1973 by the intergovernmental OECD, Organization for Economic Cooperation and Development, known in international jargon as the "Rich Countries' Club". Its findings were completed and published in 1977. The programme aimed at developing a set of social indicators, which identified 24 "social concerns" in eight "goal areas": health; individual development through learning; employment and the quality of working life; time and leisure; command over goods and services; physical environment; personal safety and the administration of justice; social opportunity and inequality. The programme was limited to OECD countries.

Another attempt, much more modest and on a reduced scale, has been made by the Overseas Development Council, an independent foundation in the U.S.A., the aim of which is to deepen the knowledge of and sensitivity to issues of World Development.

In 1977 it presented the "Physical Quality of Life Index" (PQLI), based on the measurement of three elements: Life Expectancy at Birth; Infant Mortality; Literacy. It is a universal and composite summary which, according to its authors, enables presentation of a more faithful measurement of results in such meaningful areas of development as nutrition, medical care, income distribution and levels of education than a simple index of per capita income.

The Aspen Report to the U.N. Environment Programme of 1977, "Basic Human Needs: A Framework for Action", tries to define the dimensions of needs, the dimension of poverty and the issue of income distribution and disparities, classified into four groups of "reference countries". The basic needs analysed are Food, Health Services, Education, Shelter and Clothing. Resources to meet them are: Energy, Material, Adaptable Technology, Trade and Aid.

According to the authors of this Report, the analysis of "needs" demonstrates their complexity, and the differentiation in meeting them at levels of "deficiency" and "sufficiency". There is the obvious difficulty of measuring the "bio-physical means" - food, water, energy, shelter, needed to achieve "psychosocial ends" - education, security, recreation, communications.

Apparently, of the said three indices, the least complicated is the PQLI. It limits itself to physical indicators, easily identified and measured. Nevertheless, it contains a most dramatic innovation by demonstrating that the GNP by itself is not an exclusive indicator, even in purely "physical life quality". By using the PQLI, some countries with a lower GNP fare better than countries with a higher GNP. This also holds true for intra-country comparisons. By being an answer to the once traditional "growthism", the PQLI focuses on the need to concentrate on "Basic Needs", and is therefore primarily useful and important for countries and areas of poverty and low income.

The OECD and the Aspen Reports, although of universal character, are of particular importance to the more developed countries and groups. Here the emphasis moves from satisfaction of "basic need" more to "alternative life styles". The difficulties in establishing indicators, standards and measurements grow simultaneously with moving up the scale from biophysical means to "psychological ends". Even apparently simple "goal areas" like health present difficulties in establishing indicators. Can the number of hospital beds or doctors per 10,000 population in fact serve as a satisfactory indicator of health in a society? Ongoing concern with food, dietary issues, babies' food and milkpowder, reflect existence of doubts even in this area.

But real challenges face the developed countries in establishing Quality of Life indicators in meeting the growing expectations on issues like quality of work-life, job enrichment, use of free time and recreation.

What are going to be the results of longer life expectancy? Second chance education? Change of employment? Retirement policy - earlier, later, flexible? Part-time occupation? Adult education and its suppliers, universities, trade unions, pension funds, public authorities? Housing problems resulting from new demographic configuration - old age homes? Mixed neighbourhoods?

All these changes are impending, affecting us already today, and causing implicit or explicit concerns and expectations, and consequently require setting up of a national policy, societal and national objectives, and consequently the need for defining indicators of their achievement.

Perhaps, even before agreeing on the social indicators and indices themselves, every society will have to make decisions within four basic value-areas:

- (a) Minimum income - necessary condition for "Quality of Life" consideration;
- (b) Maximum income - suggesting a ceiling for the amount of resources to be put at an individual's disposal as a way in which a society can



express concretely its concern for inequality (taxation, spending, size of house, number of cars).

(c) Scope of diversity - freedom of the individual to make his choice among available or possible goods and services; for this aim - freedom of expression and association, these being rights and objectives in themselves, and also vital for exercising a person's self-reliance and self-realization, individually and socially (self-reliance, in various expressions, appears already as an important issue in the discussion on New International Economic Order).

(d) Scope of organization - limitations in the exercising of freedom, both individually and socially, being necessary for the basic organization of society and its functioning within satisfactory norms, permitting also economy of scale. (In other words, the classical concept of "anarchy" is not compatible with objectives of "progress")

In discussing these value areas, two issues should be examined:

- (1) What is the lowest organizational unit to be aware of, and to be charged with responsibilities for introducing the standards of the accepted indices?
- (2) What are the "enabling instruments" for translating those indices into operational targets? Education, persuasion, legislation? By-laws of local and central government?

The effectiveness of the new Quality of Life indices will be judged by their usefulness in accelerating the achievement of concrete development objectives.

Here is a concrete example: suppose a country in question has established a comprehensive set of social indicators for the next decade. How does it affect the physical planning of a new neighbourhood in a big city? Allocation of grounds for recreation? Needs for changing population patterns? Will the "basic need" for "social opportunity" and equality result in restrictions on building new units in excess of certain standards?

Although no answers exist as yet to these questions, it seems the "Alternatives to Growth" and "New Life Styles" will necessarily move soon from the realm of academic circles to that of policy makers. The various professional groups will have to make adjustments to include the new indices in the exercise of their trades.

What would be the implications of the issue of new Quality of Life indicators for Urban Planners? They have to take into consideration the additional set of guidelines emanating from national objectives, and local quality of life indicators. On the other hand, they will have to participate actively in their formulation, in order to ensure the inclusion of their most important input in the definition of national objectives and indicators. This holds true both in developing countries which are facing such tremendous problems as rapid urbanization without industrialization, and in developed countries with their changing life-styles, reflected in issues of physical planning and in relations between centre and periphery.

# Recent Developments in Community Participation in Urban Planning in the United States

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In recent years urban planning throughout the world has become much more comprehensive in scope, adding to its basic concern with the built environment, economic, political and social policies. At the same time there has been a shift away from end-state plans to a greater flexibility of efforts designed for a more immediate future. These changes have brought urban planning closer to the interests, concerns and comprehension of the general public, particularly the poor and the minorities. These groups have become more politicized as a result of the civil rights movement, the effort to decentralize education, and the example of student protests. In this process, the role of the planner has been converted from that of technical expert whose decisions are final to that of a formulator of alternatives, leaving urban policy to emerge from the interplay of conflicting interests in the political area.

Community participation has been advanced by a number of changes in general public attitudes. First, there has been a shift away from emphasis exclusively on economic growth to a greater degree of concern for an equitable distribution of the aggregate product. This has been linked to a subtle but discernable trend in attitude away from equal opportunity and towards equal share. It has also been associated with an increasing demand for a rise in the quality of life even when it is at the expense of the quantity of income. Finally, it is also manifest in the declining premium on economic efficiency and the rising concern for human welfare and demand for more humane scale.

There has also been a devaluation of the earlier achievements of urban planners. Public housing estates which were once considered to be commendable efforts to change the residential environment of the poor on a massive scale are now viewed as ghettos for the minorities and the indigent. High rise buildings and super highways have had a similar decline in applause because they realized their original intent all too well or because the value system on which they were based has since been altered.

Within the city, the competition for land between powerful institutions in need of expansion and the surrounding residential area has brought the conflict of goals sought by different sectors of the population into sharper focus. The in-city hospitals concerned with the provision of medical service, the University reacting to a large rise in applications, the sponsors of civic centers intent on grouping public buildings for efficiency or cultural facilities for edification all felt their purpose justified the taking (through purchase or condemnation) of adjacent areas to build new or additional structures. The residents of such areas first accepted the dislocation from their homes quietly and sought other places to live. But as time went on, they became more and more outspoken in their opposition and began to insist that they had as much claim to the area as any alternative use. They then began to demand that the proposed project be cancelled or that the dispossessed families be aided in finding new accommodations and compensated for their

cost and inconvenience. Such ad hoc eruptions often led to negotiations in which the demands of each side were reconciled and a new plan for the area developed. The logical next step was the realization that the participation of all interested groups in the initial planning effort would save much grief and the additional time that such involvement took served to reduce the time spent in conflict at the end of the process.

Community participation is a means of involving people outside of the government in the planning process. It is particularly aimed at poor people who frequently are the uncompensated and powerless victims of city rebuilding. The powerlessness of the poor is nowhere more vivid than in public or private urban renewal. This process in the past has often asserted that the land under the homes of the poor is more valuable if it is used for some other purpose. The planning decisions are made by others for the benefit of still others. Their exclusion from the process make the poor suspicious of governmental action and planners purpose, particularly when the purpose was not clear or the time gap too long. In the past it has meant withdrawal or, if the political climate was right, eruption into violence. Powerlessness breeds frustration and frustration leads to explosion.

Urban planning, particularly at the neighborhood level, provides an opportunity for the resident population to participate in setting their own goals and building their own future. The local residents know their own social and economic needs best. These have budgetary and land use implications and planning helps translate them into operational terms.

Local participation has taken several different forms, each of which has a different relationship to the planning process.<sup>1</sup> Citizen involvement is the process by which private citizens and organized groups help government decide on public policy issues. Community organization is the process by which local groups represent residents' interests in controlling development, attracting resources to a community and otherwise help preserve or improve an area. Advocacy is strong presentation of a program by a professional group to advance the interests of a poor local group.

Sherry R. Arnstein, in an article that became a classic shortly after its publication less than a decade ago, submits that "citizen participation is a categorical term for citizen power...participation without redistribution of power is an empty and frustrating process for the powerless. It allows the powerholders to claim that all sides were considered but makes it possible for only some to benefit. It maintains the status quo."<sup>2</sup>

Arnstein has set forth a sequence of degrees of involvement that is useful in assessing the efficacy of the process. The lowest levels consist of membership on advisory boards which convey the semblance but not the actuality of participation. The next step is consultation and placation through the selection of a few "worthy" poor to serve on local bodies. The top of the ladder consists of partnership (sharing of power through participation in the budget), to delegated power (citizens are a majority of the board), and finally to citizen control with no intermediary between the local corporation and the source of funds.

As community participation has grown, the functions that it performs and the techniques that are used have increased in number and variety. Judy B. Rosener has compiled a list of 14 functions and 39 techniques and has cross tabulated them in order to determine which functions a specific technique will serve.<sup>3</sup> The most frequent functions are the identification of attitudes and opinions, the facilitation of participation, the classification of the plan process and the determination of plan program and policy review. The most versatile techniques determined by the

number of functions that are served are as follows:

Charette - The assembly of interest groups for intensive meetings.

Citizen's Advisory Committee - An ad hoc organization of citizens to present the ideas and attitudes of local groups.

Citizen Employment - The direct employment of client representatives.

Coordinator - Provides a focal point for citizen participation in a single individual.

Design-In - A technique in which citizens obtain a view of the effect of a project or plan on their community.

Fish Bowl Planning - An open planning process in which all parties can express their views before a proposal is adopted.

Meetings - Community Sponsor - Organized to focus on a particular plan or project.

Open Door Policy - Encouragement of citizens to visit local project office without prior appointment.

Short Conference - Intensive meetings organized around a detailed agenda.

Workshops - Working sessions to discuss technical issue and to reach an understanding regarding its role in the planning process.

In the 1950's in the United States, participation was held back by a futile effort to promote metropolitanism. As suburbanization went into high gear after World War II, it became apparent that the older central cities and their newer surroundings areas were part of the same urban entity and proposals were made to establish metropolitan regional agencies. These ranged from suggestions to organize individual functions such as transportation and air pollution control on a metropolitan basis,<sup>4</sup> to proposals for political integration of city and suburbs, such as occurs in annexation. Thus, metropolitanism represented a greater degree of centralization than had been in existence prior to that time.

Participation, which in a real sense means the decentralization of power, was advanced by the Federal government in several important pieces of legislation. The Housing Act of 1954 set up the Comprehensive Planning Assistance Program (Section 701) which provided support to local areas for the development of long range plans that included citizen participation in their preparation and implementation. Similar developments occurred in programs administered by the Department of Transportation, the Department of Commerce, and the Environmental Protection Administration.

It was not until the 1960's that the major advance in participation took place. The Community Action Program enacted into law in the Economic Opportunity Act of 1964 provided for the "maximum feasible participation" by residents of an area in the preparation of a plan and in its execution. Two years later, Demonstration Cities and Metropolitan Development Act (known as the Model Cities Program), was passed. This was an attempt to involve the residents of a slum or blighted area in a number of cities in the physical, social and economic improvement of their neighborhoods. Although the mayor was nominally in charge of the local program,

it could be funded by the Department of Housing and Urban Development only if it involved extensive citizen participation. While these two pieces of federal legislation fell considerably short of achieving their total objectives because of the conflicts that arose among local groups and between the locals and the elected officials, they did succeed in establishing the concept of citizen participation as a firm fact of life in urban planning.

The Housing and Community Development Act of 1974 recognized political realities by placing the disposition of block grant funds for housing and community development in the hands of local elected officials. But at the same time it required local citizens to be given adequate information about planning proposals, mandated public hearings, and submitted that local groups must be given an opportunity to participate, but did not stipulate a city-wide structure for local participation.

In some cities, the observance of participation has been perfunctory, but in many, community organizations have presented specific programs intended to influence the distribution of federal community development funds. Many have gone beyond the Federal requirement and have set up a fixed legal procedure for involving local areas in planning decisions.

One of the most notable cases has been the City of New York which was an early entrant into the arena of citizen participation.<sup>5</sup> The impartial and respected Citizens Union and the Citizens Housing and Planning Council were among the first to be recognized. It was their campaigns that led to the establishment of the first City Planning Commission in New York in 1938. In the 1950's the Park-Hudson Neighborhood Council was set up on Manhattan's Upper West Side. Selected with the participation of the mayor's office and funded by a private foundation, this council was to form the prototype for the entire city. The Council consisted of local leaders in community affairs plus a sprinkling of architects and city planners. While the Council's role was advisory, its views carried considerable weight because of the influence of its members and the professional quality of its reports. In the late 1950's, the first twelve Community Planning Boards were established by the Borough President of Manhattan in that borough. In 1961, this was extended to the entire city which was then divided into 62 planning districts based on traditional boundaries. Unfortunately, these did not coincide with service areas such as schools, health or safety districts or with census tracts, and as a consequence there was poor coordination between the delivery systems, available base data, and the planning units. The 1975 city charter revision corrected these deficiencies, but the selection of the membership still remained in the hands of the Borough Presidents.

At first the local Boards served merely in an Advisory capacity. Then they were given capital budget review for items in their own districts, with control over small matters like street lights and bus shelters. This is not to imply that the local Boards were passive during this period. Some were quite sophisticated in their testimony before the City Planning Commission and many were forceful and militant in their espousal of a program that they sought to have adopted, or in opposing an official proposal.

The major legal change, however, came in 1976 when the Uniform Land Use Review Procedure (ULURP) was introduced in compliance with a mandate in the revised city Charter of 1975. In the new procedure,<sup>6</sup> the City Planning Commission certifies all applications and refers them to the affected Community Board(s), the Borough Board and the Borough President. The Community Board must hold a public hearing and submits its recommendations to the City Planning Commission within 60 days. The City Planning Commission must approve, approve with modifications or disapprove an application 60 days after receipt and submit its decision to the Board of

Estimates. There are similar procedures for lease applications, submissions to the Board of Standards and Appeals, and actions in which the City Planning Commission is party to a variance application.

To assist the Community Boards in carrying out their heightened responsibilities the City Planning Commission provided technical staff assistance in place of the limited staff liaison that previously existed between the Commission and the Boards. Passow<sup>7</sup> evaluates this experience in the following manner. "Depending on their grasp of how government works, the Boards used the Planning Department staff more or less effectively. Some were able to obtain highly conceptualized and detailed plans for neighborhood shopping malls, rehabilitated community facilities and waterfront parks. Other Boards, caught up in the political cross-currents, rejected intervention by the Department staff and became partisan supporters of the Borough President's objectives, when these clashed with the Mayor's. On the whole, a relatively good working relation evolved between the Community Boards and City Planning Department staff, which provide technical analysis and judgments on zoning, site selection, mapping and all kinds of development... the local Boards have learned how to maximize their advisory role, though too often in a negative way."

Thus, in general, the experience with the local Community Boards has been mixed. In the early days some Boards found it difficult to distinguish between planning and municipal operation. On visits to local areas, the City Planning Commission was often met with complaints about inadequate garbage collection or street repair. There also was resentment against any presentation that they considered to be a firm proposal generated without their participation rather than a suggestion for discussion. Most significant was the fact that members of local Boards had little sense of priorities. They often presented long "wish lists" (housing, schools, parks, health centers, etc.) all of which may have been justified by their needs, but which were far in excess of available resources. The community Boards are now inclined to deal in a more realistic manner with issues and proposals that appear before them.

There are many obstacles in the path of effective local participation in the planning process, particularly among the poor. According to Spiegel and Mittenthal, the factors that militate against the sophisticated exercise of authority in planning by the poor are their lack of experience, their short time horizon and the inevitable conflict between their own objectives and the interests of the city as a whole.<sup>8</sup> Moreover, there appears to be a tendency to concentrate on housing, although in recent years this has been tempered by demand for employment opportunities and adequate safety.

The experience with the Model Cities Program revealed that where large sums of money are available for local public purpose there is a major struggle for their control. Money means jobs and jobs mean power, particularly in areas in which unemployment is rife. Often the struggle for control dominates the scene, and the original purpose gets lost in the confusion.

The conflict between local and municipal objectives is not limited to the poor. People in middle class areas also object to needed but obnoxious uses. Who would accept a garbage depot in his neighborhood, even if it called a marine transfer station, as it is in New York. Rosenbaum<sup>9</sup> has pointed out that one of the benefits of effective citizen involvement is "rational decision making which neither requires or implies rote responsiveness to majority or plurality preferences. There may be numerous occasions when these preferences should be overruled in a particular jurisdiction because of legal or technical considerations."

Perhaps the most vital questions are "who shall represent the local people? How are they to be chosen? How are the poor to be protected"? It is not unusual at

public hearings to have several self-selected and self-designated groups, each insisting that it is the true spokesman for the local people. Perhaps none are, in as much as there may be no local consensus or perhaps all are in as much as each may reflect the attitude of a specific sector of the local community. There are basic questions in the theory of representative government and its resolution in this context is essential if citizen participation is to constitute a new and higher level of democratization.

Rosenbaum has pointed out that "the major benefit of an effective citizen involvement program is the increase in the civility of the decision-making process."<sup>10</sup> He maintains that the lack of civility is a symptom of discontent with the growth of administrative power and reflects a breakdown in the citizens' fundamental trust in government.

While genuine participation may aid in recovering trust in government, it is also necessary to understand and accept the essential difference between the role of the advocate and that of the officer of government.: "The tradition of territorial planning has been for the...planner to have a vision of what is desirable, and to advocate his convictions with as much vigor as possible. However, freedom of advocacy seems to vary inversely with the responsibility for actions...As long as a planner is outside the government, and what he advocates bears no necessary relation to what is done, he is permitted and even encouraged to speak his mind without compromise. But once he is within the institution of government and has had the responsibility of power, he must seek and listen to the opinions of others, and he must be responsive to interests and viewpoints other than his own. Indeed, he becomes the spokesman and instrument for a collective process of decision. The price of power is the loss of individual freedom and independence, and the cost of unrestricted advocacy is the exclusion from power."<sup>11</sup>

The establishment of a process of local participation not only benefits the people whose lives are affected by planning, it also inserts a degree of rationality into the entire process that it would otherwise lack.<sup>12</sup> By including the desires and preferences of local groups and by recognizing the nature of the role of each of the participants, the boundaries of the calculus of planning are enlarged. Local participation in urban planning thus has a purpose far beyond its immediate horizon. It is the test of the responsibility and independence of local citizens and of the responsiveness of local government to the needs and demands of all sectors of society. The goals of democracy will be advanced to the extent that this test is met positively by all participants in the process.

#### FOOTNOTES

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2. Arnstein, Sherry R., "A Ladder of Citizen Participation", Journal of the American Institute of Planners, 35 (July, 1969).
3. Rosener, Judy B., "Citizen Participation: Tying Strategy to Function" in Citizen Participation Certification Community Development, edited by Patricia Marshall, National Association of Housing and Redevelopment Officials, Washington, D.C., Feb. 1977.

4. For example, see: Performance of Urban Functions - Local and Areawide, Advisory Commission on Intergovernmental Relations, Washington, D.C., Sept., 1963.
5. For a full treatment of participation in New York see: Shirley Passow, "Legal Foundations for Public Participation in City and Town Planning: New York City as a Case History" paper presented at the Fourth World Congress of Architects and Engineers, Tel Aviv, December 1976.
6. Uniform Land Use Procedure - A Guide for Community Boards, Department of City Planning, NYC DCP 77-04, January, 1977.
7. For a full treatment of participation in New York, see: Shirley Passow, "Legal Foundations for Public Participation in City and Town Planning: New York City as a Case History" paper presented at the Fourth World Congress of Architects and Engineers, Tel Aviv, December 1976.
8. Spiegel, Hans B.C., and Mittenenthal, Stephen, Neighborhood Power and Control: Implications for Urban Planning, Columbia University, Institute for Urban Environment, New York, 1968.
9. Rosenbaum, Nelson M., Citizen Involvement in Land Use Governance - Issues and Methods, the Urban Institute, Washington, D.C., 1976.
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## Introductory Note

Of the papers presented at this panel on psychological aspects in urban planning, the one by Prof. Sven Hesselgren takes up the basic aspects of emotions aroused in an individual by visual impressions. As a basis for his study Prof. Hesselgren adopts a gamut of primary emotions defined by another author, who pairs them together in polarities as follows:

ANGER - FEAR  
JOY - SORROW  
ACCEPTANCE - DISGUST  
SURPRISE - ANTICIPATION

What method can be used to detect emotional impacts of environmental perceptions? The best method for this purpose seems to be the "semantic differential" method.

We supply our subjects - Prof. Hesselgren states - with a list of words describing certain "mixed emotions". Each word can be given a place in a scale built up as follows: "not at all - some - much - the highest degree of". We ask our subjects to fill in this "semantic differential scale" in such a way that it describes the emotional load of an artificial environment which they see, either in reality or projected on a screen. Using a certain method of diagrammatic representation, we can obtain a good notion of the way in which each specific environment is emotionally loaded - we get an "emotional loading profile" for each one of them.

What do the emotional loadings mean to an inhabitant of a specific environment? It is an open question how a spectator may be influenced by these emotional loadings. This aspect opens up a new series of problems to psychological research.

To illustrate his findings, the author gives a practical example. A certain building detail has a particular form: it is not horizontal nor vertical, but slanting. We call it a "roof". It has the meaning of protection. In Sweden, where Prof. Hesselgren lives, people are fond of protective roofs, and a roof has for them an emotional loading of friendliness - they feel happy to have a protective roof on their homes.

This simple example illustrates the emotional loading due to the perception of environmental and, more specifically, architectural features.

The spatial human experience is analysed by Dr. Arie Peled in his paper on "The Man in the Street: Notes on the Existential Meaning of the Street and its Spatial Implications". This experience is defined by the author as a dialogue between the individual and the urban environment and is in his view the most representative of the person's relationships with the community. This dialogue is characterized by the dimensions of detachment and exposure which govern all aspects of the person's experience of the street.

The paper then proceeds to look at the residential street and the hierarchy of inside and surrounding places of which it consists. This is done in an attempt to reveal the potential of detachment and exposure inherent in both their content and in their spatial definition: their location, division, and direction one towards the other and towards the street.

The survey is illustrated by an analysis of existing and designed residential streets.

A person's desirable contact with the outer world in an urban environment must be in balance with his need for privacy. This balancing aspect of the quality of urban life is taken up by Dr. Arza Churchman in her paper entitled "Privacy and Crowding: What Do These Mean in the Urban Context".

The social and environmental conditions of privacy and the means available for achieving them in public urban spaces are not equivalent to those expected or available in the home. Desired privacy can be achieved through physical, environmental means and/or through behavioral and psychological means. However, the design of spaces which can accommodate varying needs would facilitate the achievement of a given privacy goal. Consequently, design elements must be flexible and varied, in addition to fitting the cultural and symbolic definitions of the physical setting,

The antithesis to privacy, that of crowding, is defined as the psychological experience of discomfort associated with a negative evaluation of a given density condition. Design and planning elements can aid in the minimization of feelings of crowding and contribute to the attainment of the desired levels of privacy. Open space can serve this purpose, if planned with it in mind.

The critical element of the approach to both privacy and crowding is the fact that the definition and evaluation of each situation are personal ones. The goal should be to offer sufficient variety within the urban scheme, so that each individual or group may find the setting congruent with their behavioral or emotional needs. These personal definitions are, however, influenced by physical, social and cultural factors, so that the task is not an impossible one. There are many commonalities and shared aspects upon which to base a planning program.

# Emotional Loading of Environmental Perceptions: A Contribution to Architectural Psychology

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Many researchers have studied "connotations" of the perception of environments by means of the "semantic differential" method, developed by Osgood (Osgood, et al, The Measurement of Meaning, 1957). The choice of words that have been used has varied. Together with a group of people attending a course in Architectural Psychology, and taking into consideration the results of research carried out elsewhere, I established a list of words in accordance with Fig. 1.

Figure 2 shows the arithmetical averages as well as the dispersion around these averages concerning the connotations to the two bedrooms - "bedroom bread" and "bedroom pastry" - see below.

It is possible to distinguish between different kinds of connotations, namely 1) words describing emotions with a secondary accent on evaluation, 2) words in a transferred sense describing emotions, 3) words describing evaluations with a secondary accent on emotions, and 4) words mainly describing meanings. In Fig. 1, the words describing emotions can give rise to an "emotional load profile" of the perceived room.

Concerning the words describing evaluations I have taken into consideration opinions expressed by experimental psychologists, Daniel Berlyne and Rikard Küller as well as the semiotician Umberto Eco. Berlyne asserts that the polar opposites "interesting-uninteresting" is a dimension in the realm of aesthetic evaluation, as important as "beautiful-ugly". Küller has especially studied the dimensions "uniform motley" and "variable-monotonous". Eco has drawn our attention to the dimension "new-old". It is apparent that Eco's dimension has a double meaning of interest to us. From one point of view, it can mean "to me new and unexpected-to me old and well-known"; from another point of view, it can mean that the subject finds what he perceives as "modern" or "ancient".

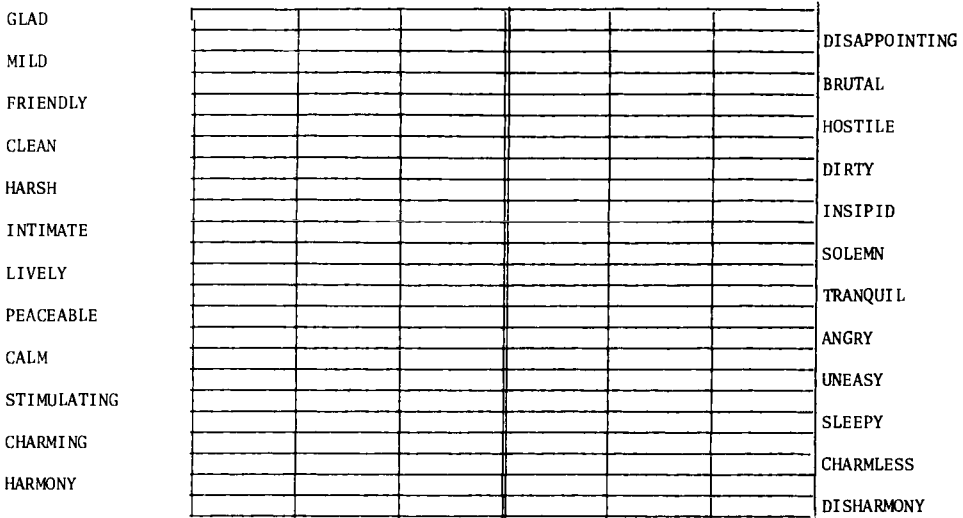
In the first case, the words mainly describe evaluations, although positive or negative evaluations of "new" and "old" can vary for different individuals. Or to be more exact: the highest positive value is for all individuals placed somewhere between the two extremes, but in different places for different individuals. Thus an architect tends to place himself nearer to "new", a layman nearer to "old".

In the second case "modern-ancient" describes the subject's opinion of how old he finds the object. Something that seems "ancient" can at the same time in the subject's mind to him be "new and unexpected". I myself count "modern-ancient" among "meanings", and I am eager also to catch the subject's opinion what could be "protecting" or "exposing".

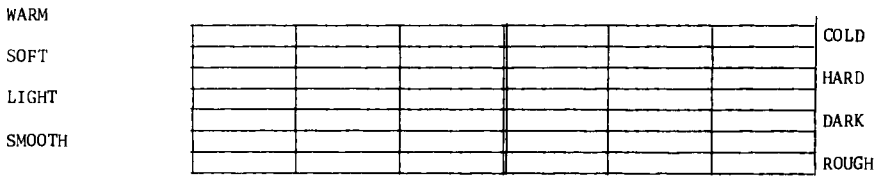
The diagram is arranged in such a way that words with positive evaluations are placed to the left, those with negative evaluations to the right. Most often this

Words describing emotions with a secondary accent of describing evaluations:

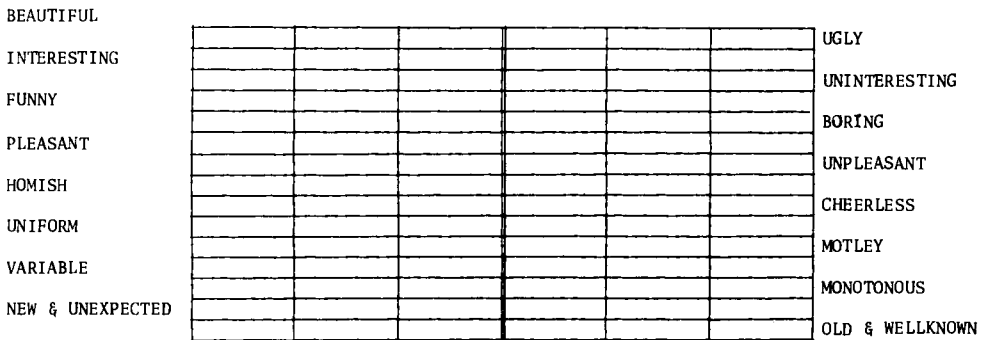
extremely   much   a little   not at all   a little   much   extremely



Words in a transferred sense describing emotions:



Words describing evaluations with a secondary accent of describing emotions:



Words mainly describing meanings:

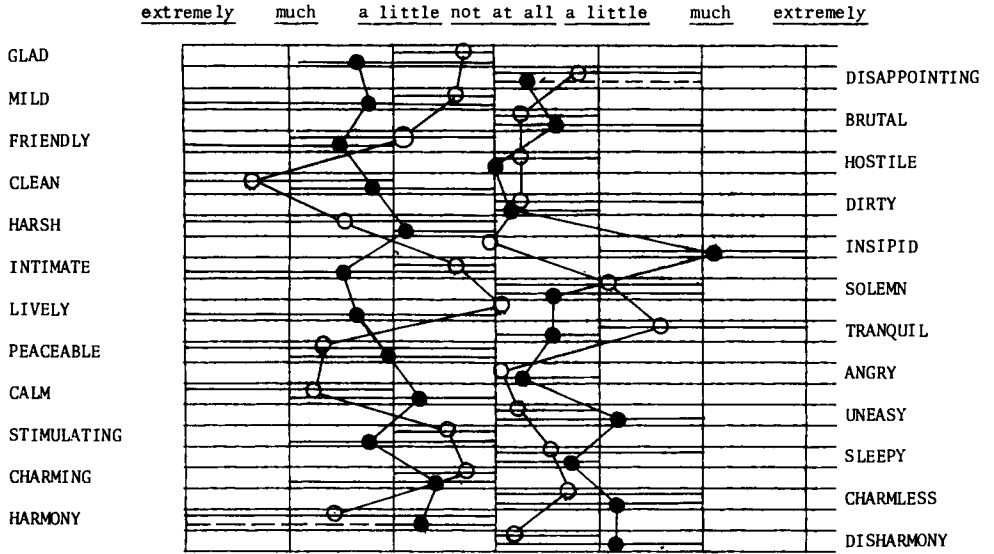


○ = Arithmetical average concerning  
 — = Dispersion around the average

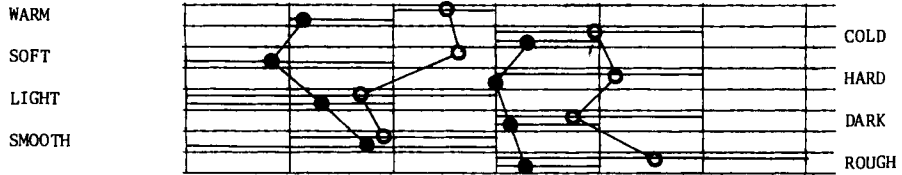
○ = Arithmetical average concerning  
 - - - = Exceptional extreme judgement

Fig. 1

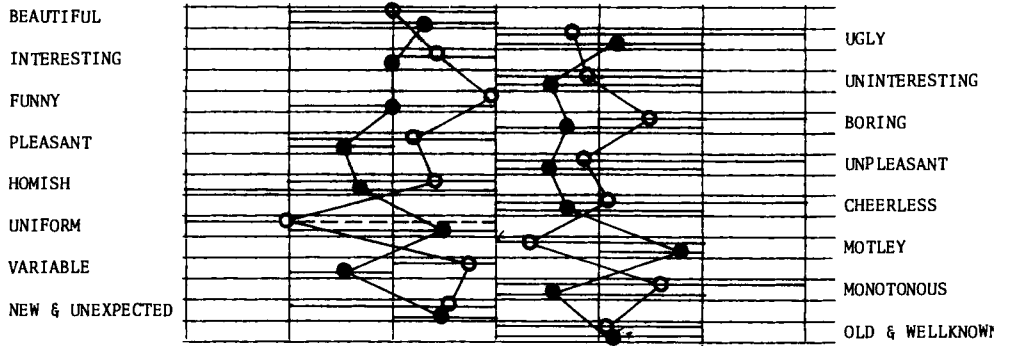
Words describing emotions with a secondary accent of describing evaluations:



Words in a transferred sense describing emotions:



Words describing evaluations with a secondary accent of describing emotions:



Words mainly describing meanings:



○ = Arithmetical average concerning Bedroom "bread"  
 ● = Arithmetical average concerning Bedroom "pastry"  
 — = Dispersion around the average      - - - - = Exceptional extreme judgement

Fig. 2

is rather simple to do, since also the emotion describing words often have a secondary accent on evaluations. In some cases, however, this is not the case.

In the diagrams at Figs. 2-5, the arithmetic averages of my subjects' judgements are shown together with their dispersions.

In representing the results of semantic scaling in this way, it is possible to compare the connotations of different environmental perceptions. For instance, Fig. 2 gives a comparison between two rooms with the same function (bedrooms) but with two definitely different characters, the one named "bread", the other "pastry" because their appearance suggests these two things. In Fig. 3 a festival hall and studio are compared. Fig. 4 shows the result when the view over Slussen (a well-known traffic node in Stockholm) shifts from sunshine to haze. Fig. 5 shows the "emotion and evaluation profile" of a peculiar building, probably an oil sheik's palace. A lot of informations can be achieved from these diagrams.

"Bedroom bread" vs. "bedroom pastry". (See Hesselgren, The Language of Architecture, Figs. 36:5 and 36:4. )

"Bedroom bread" is judged to be more than "much" clean, and between "some" and "much" concerning "harsh", "peaceable", "calm", and "harmonious". On the other hand "bedroom pastry" on the positive side is just around "a little" all over. On the negative side "bedroom pastry" is more than "much" insipid".

"Festival hall" vs. "studio".

Both rooms were judged to be most often between "a little" and "much" positive (I think that "solemn" and "tranquil" in this case ought to be counted as something positive). In some cases the festival hall was judged to be more than "much" where the studio was found to be less than "a little", and vice versa.

On the negative side one finds most often in both cases "not at all" or at least less than "a little".

Slussen in sunshine vs. Slussen in haze. (See Hesselgren, The Language of Architecture, Figs. 36:6 and 36:7.)

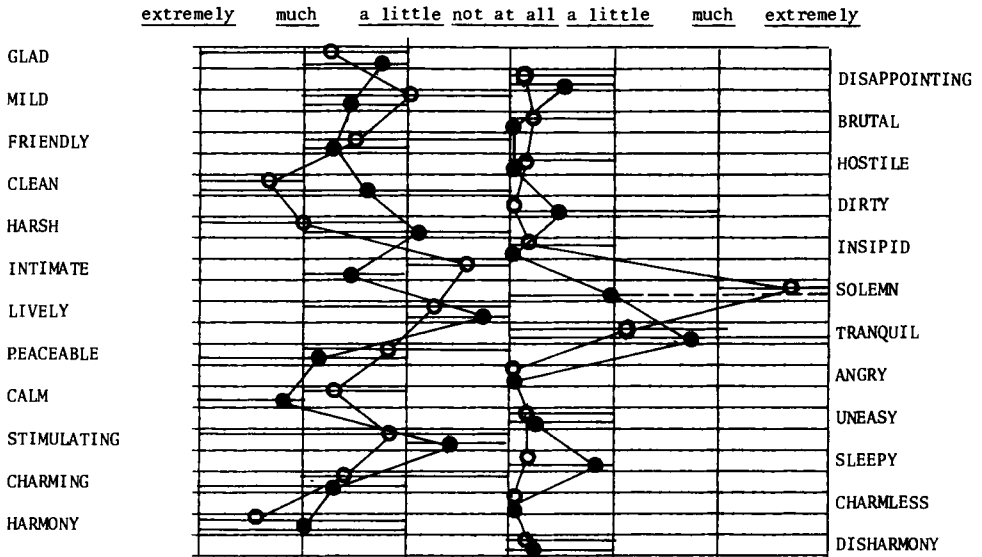
Apparently sunshine enhances the positive aspect of Slussen. The place is even in haze mainly judged as being between "a little" and "much" positive. In both cases the place is less than "a little" negative.

Oil sheik palace

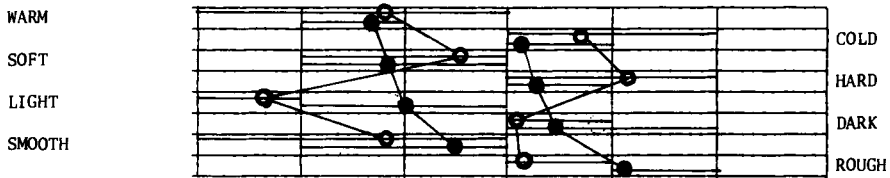
This building gives rise to strong variations concerning negative as well as positive aspects. Of some interest is to see that as well "peaceable" as "angry" are judged as "not at all" (or near to "not at all"), which means that this dimension is not relevant in this case.

The reader might easily find a lot of interest in addition to what has been said here, if he studies the diagrams.

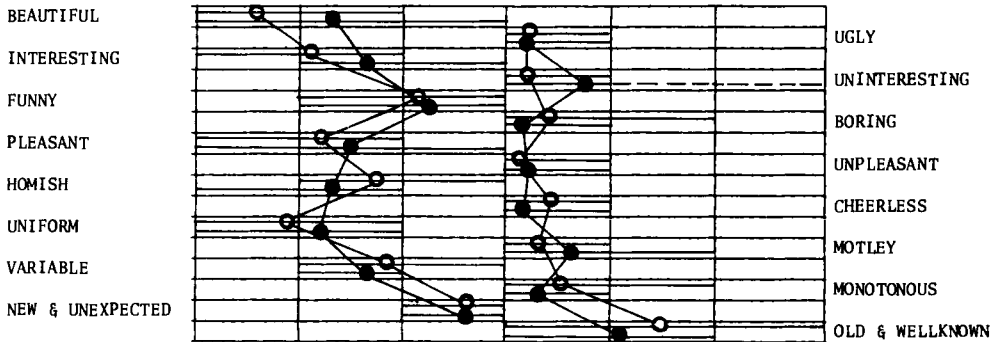
Words describing emotions with a secondary accent of describing evaluations:



Words in a transferred sense describing emotions:



Words describing evaluations with a secondary accent of describing emotions:



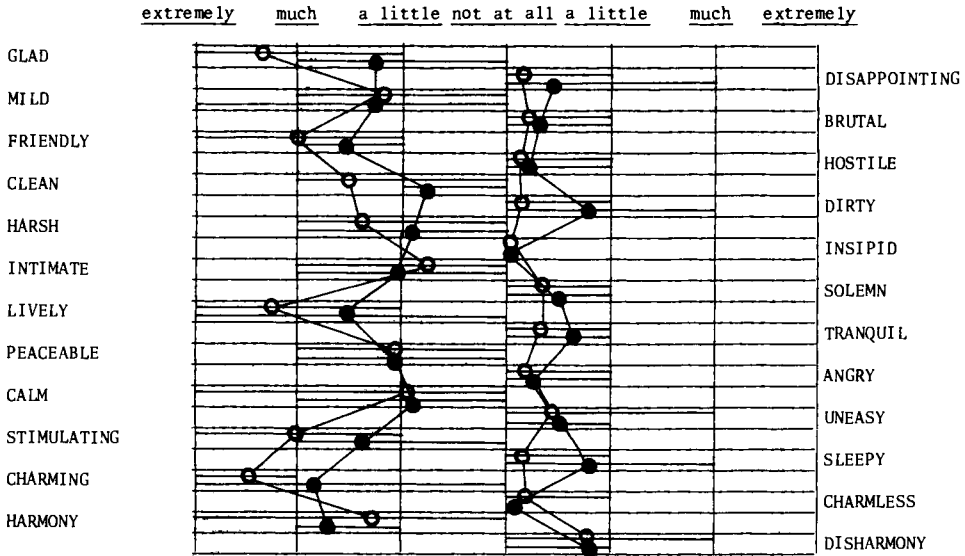
Words mainly describing meanings:



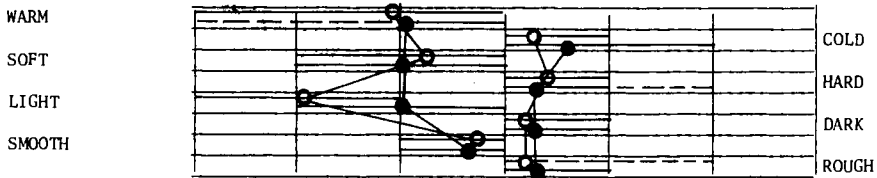
○ = Arithmetical average concerning Festival hall  
 ● = Arithmetical average concerning Attic room  
 ——— = Dispersion around the average      - - - - - = Exceptional extreme judgement

Fig. 3

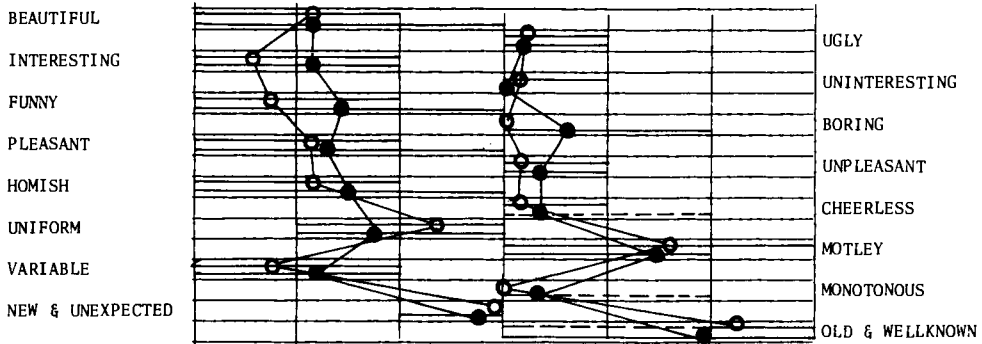
Words describing emotions with a secondary accent of describing evaluations:



Words in a transferred sense describing emotions:



Words describing evaluations with a secondary accent of describing emotions:



Words mainly describing meanings:



= Arithmetical average concerning Slussen in sunshine

= Arithmetical average concerning Slussen in haze

= Dispersion around the average

= Exceptional extreme judgement

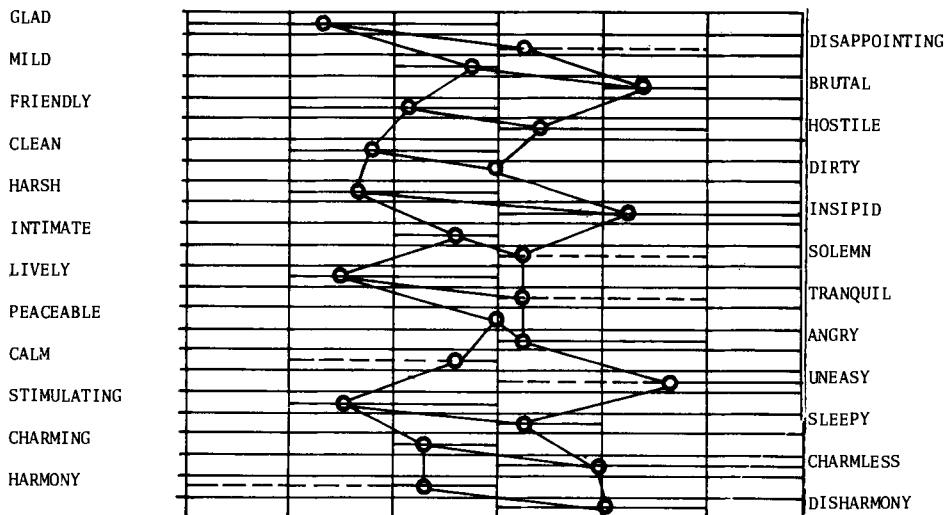
Fig. 4



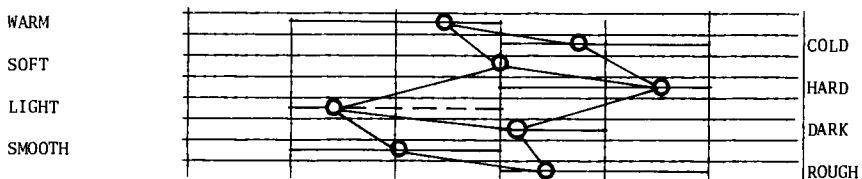
### Emotional Loading of Environmental Perceptions

Words describing emotions with a secondary accent of describing evaluations:

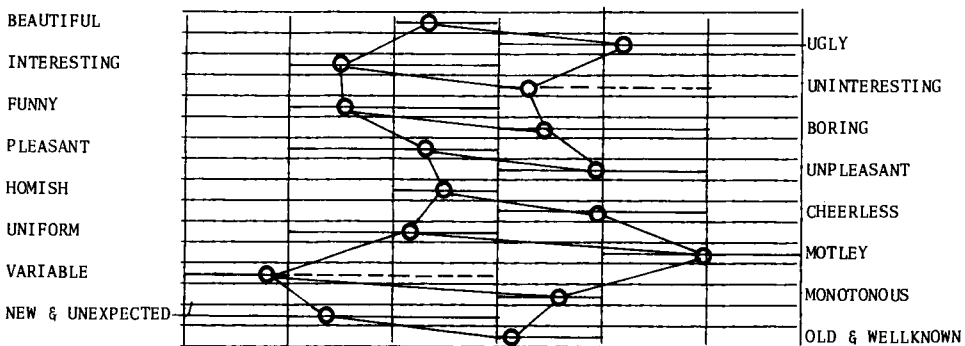
extremely   much   a little   not at all   a little   much   extremely



Words in a transferred sense describing emotions:



Words describing evaluations with a secondary accent of describing emotions:



Words mainly describing meanings:



○ = Arithmetical average concerning Oil sheik palace  
 — = Dispersion around the average      - - - - = Exceptional extreme judgement

Fig. 5

THE SYSTEM OF PRIMARY EMOTIONS

So far the question arises whether it is possible to find some kind of structure in the realm of emotions, as well as in the realms of sensations like those due to colour and visual form (described in my book, The Language of Architecture). The only psychologist who has succeeded in his approach is Robert Plutchik who has developed a new model of the structure of primary emotions (Robert Plutchik, The Emotions: Facts, Theories and a New Model, 1962).

Robert Plutchik makes the statement that emotions cannot be sufficiently studied by means of introspection. He is therefore asking himself if he can find another method. He makes the observations that emotions are reflected in a human being's behaviour, including play of facial features, and something similar holds good for the animals too. The question arises: are there some primary or elementary behaviour patterns that are common to all animals? After having first studied ecological, ethological, and physiological literature, Plutchik has found eight primary behaviours, corresponding to eight primary emotions as follows:

<u>Behaviour</u>	<u>Emotion</u>
destruction	anger
reproduction	joy
incorporation	acceptance
orientation	surprise
protection	fear
deprivation	sorrow
rejection	disgust
exploration	anticipation

These primary emotions are combined in four polar pairs as follows:

ANGER	FEAR
JOY	SORROW
ACCEPTANCE	DISGUST
SURPRISE	ANTICIPATION

Plutchik thus proposes the model shown in Fig. 6. In addition to these four pairs of primary emotions, he points to an additional dimension, namely intensity, see Fig. 7.

Myself I have developed Plutchik's three-dimensional diagram into a two dimensional one like that in Fig. 8. Plutchik has given each primary emotion to a sector of a circle, I have given each one to a radius, and am thus able to use these as vectors describing intensity, see Fig. 8.

When studying my diagram, it struck me that it was divided into one positive and one negative half. The only astonishing thing concerning this is that ANGER has to be counted as something positive, but if we think over the corresponding behaviour, DESTRUCTION, the following can be said. "Destruction is apparently a 'must' for survival and thus indeed something definitely positive. It is a big mistake in our culture that we look upon "anger" as something evil that should be avoided. In doing so we have forbidden ourselves to really feel the two primary emotions "anger" and "fear". This has led to a widespread mental disease. Concerning this I refer to Daniel Casriel (Daniel Casriel, A Scream Away from Happiness, 1972). We can thus come to the conclusion that the study of primary emotions is something very important.



Fig. 6 A Cross-Section of the Emotion-Solid

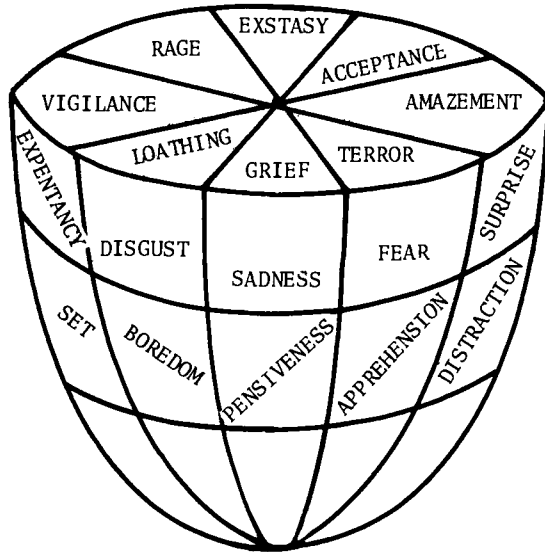
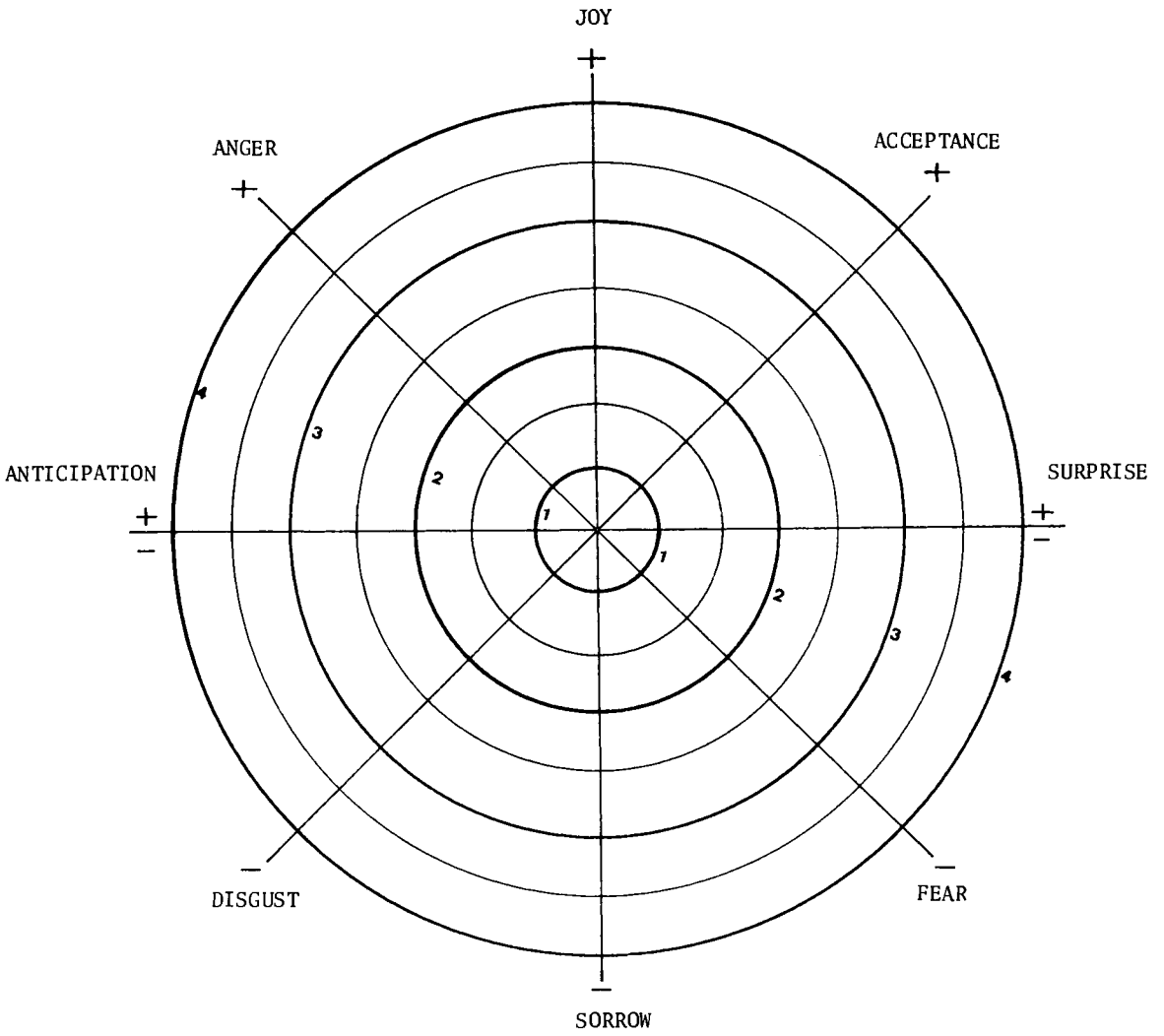


Fig. 7 A Multi-Dimensional Model of the Emotions



- 1 = not at all
- 2 = a little
- 3 = very
- 4 = extremely

Fig. 8

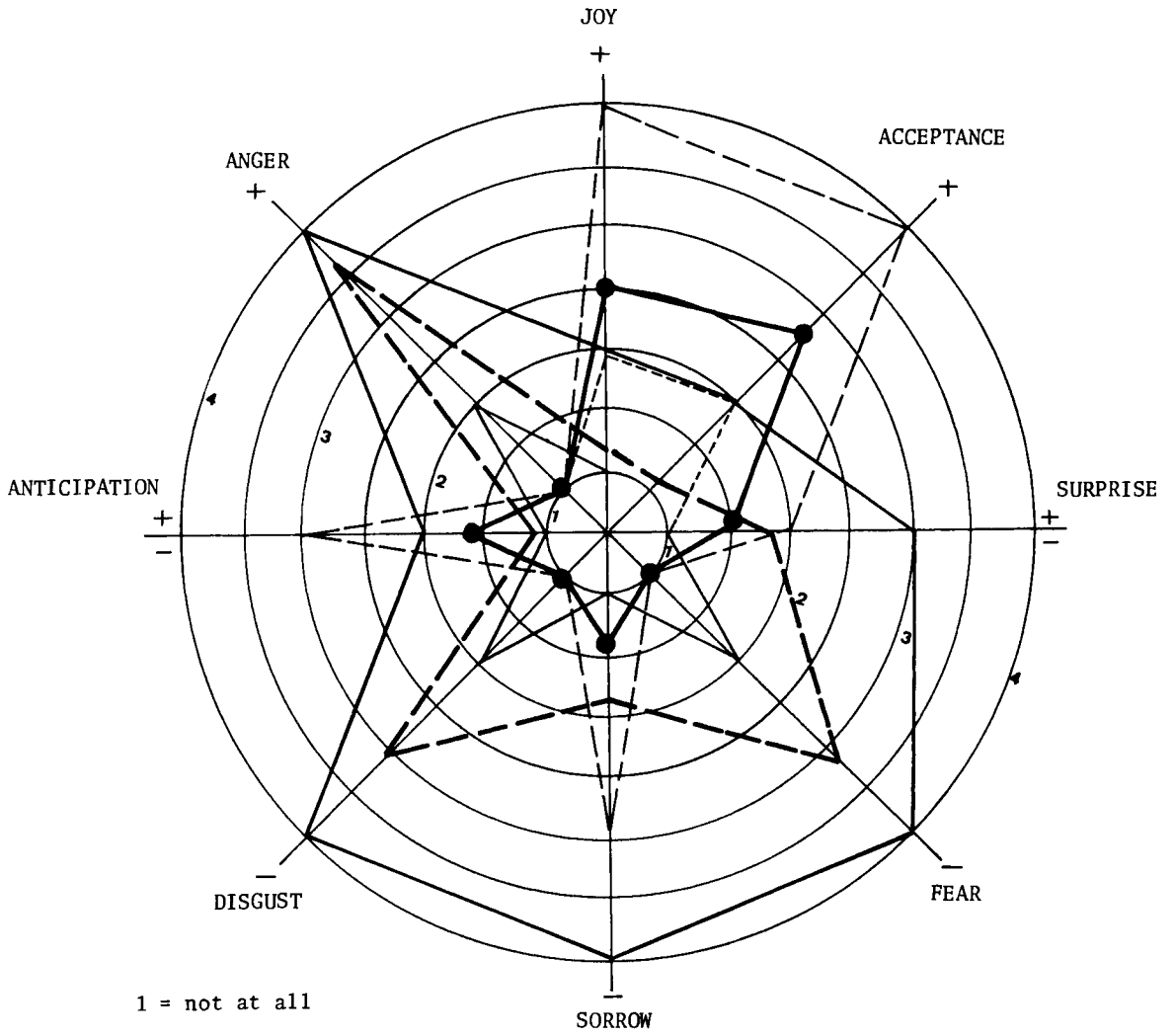
Plutchik indicates how a usual, "complex" emotion can be analyzed in terms of primary emotions. Thus, by means of semantic differentials, I have asked my subjects to analyze the "complex" or "mixed" emotions shown in Fig. 1. As three examples of the results I refer to Figs. 9, 10 and 11.

#### WHY ALL THIS?

This is indeed a legal question: why should we in architectural psychology study these matters? Architects have by intuition the feeling that an emotionally loaded architectural environment can influence an inhabitant's mood. To some extent this has been supported by psychological experiments. Thus, many years ago, Maslow made the following experiment (A.H. Maslow & N.L. Mintz, Effects of Esthetic Surroundings Journal of Psychology, 41, 1956). He had two groups of subjects, one sitting in a room they found "beautiful", the other in a room they found "ugly". To each subject was given a copy of a photo of a human face with a neutral expression. The subjects were asked to tell how they found the expression of that face. The subjects in the "beautiful" room showed a tendency to judge the face as "friendly" while the subjects in the "ugly" room found it "hostile".

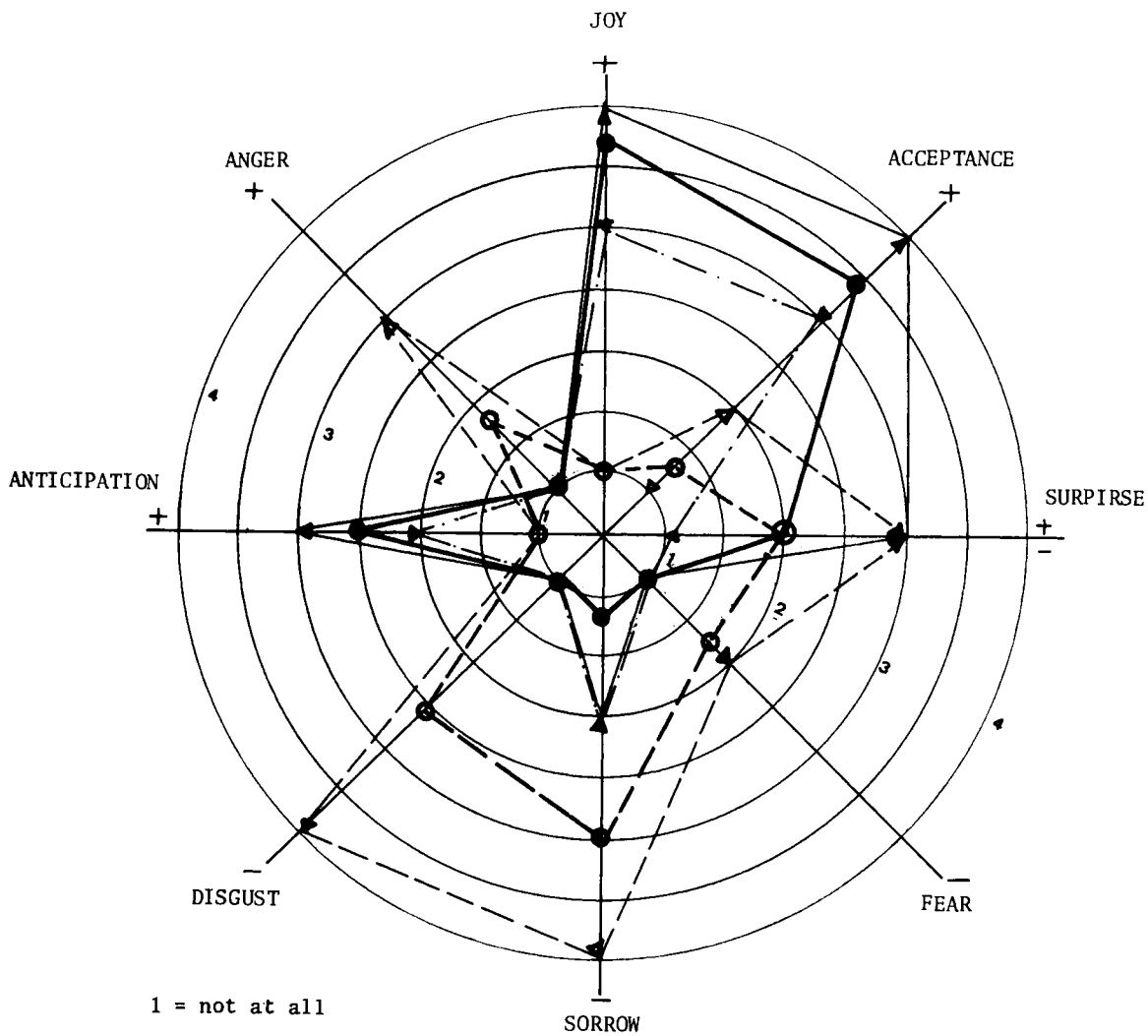
On the other hand, Dr. Locasso recently gave me some information which seems to be contradictory to Maslow's result. (Richard Locasso, The Influence of a Beautiful vs. Ugly Interior Environment on Selected Behavioral Measures, reprinted from Dissertation Abstracts International, 11, 1977). He describes an experiment carried out in order to test a hypothesis concerning the effect of a beautiful room as opposed to an ugly room, a hypothesis described in ten points: "1) tasks will be rated as more interesting, pleasant, and satisfying, 2) more time will be spent in the room, 3) photos of human faces will receive higher ratings on various evaluative scales (my underlining), 4) etc." He ends his report by saying: "The results in general provided no support for the experimental hypotheses." One experiment was in contradiction of another!

If, however, we turn from theory to praxis, we may find many examples that support Maslow's finding. Here I will take only one. Carl Larsson, the famous Swedish artist, was often a victim of depression. In order to cure himself, he built his house in Calecarlia, and he wrote an illustrated book about this work (Carl Larsson, Ett hem, 1904). This book was received with immense enthusiasm for the humanly friendly atmosphere of the house he described, and thousands of ordinary people - as well as architects - followed his recommendations, hopefully for their own benefit. As an architectural theoretician, I myself rely very much on what can be learnt from practice. So I think the problems concerning emotionally loaded environmental perceptions are well worth serious attention on the part of experimental psychology. I look upon my own work, described here, as an attempt to start something of that kind.



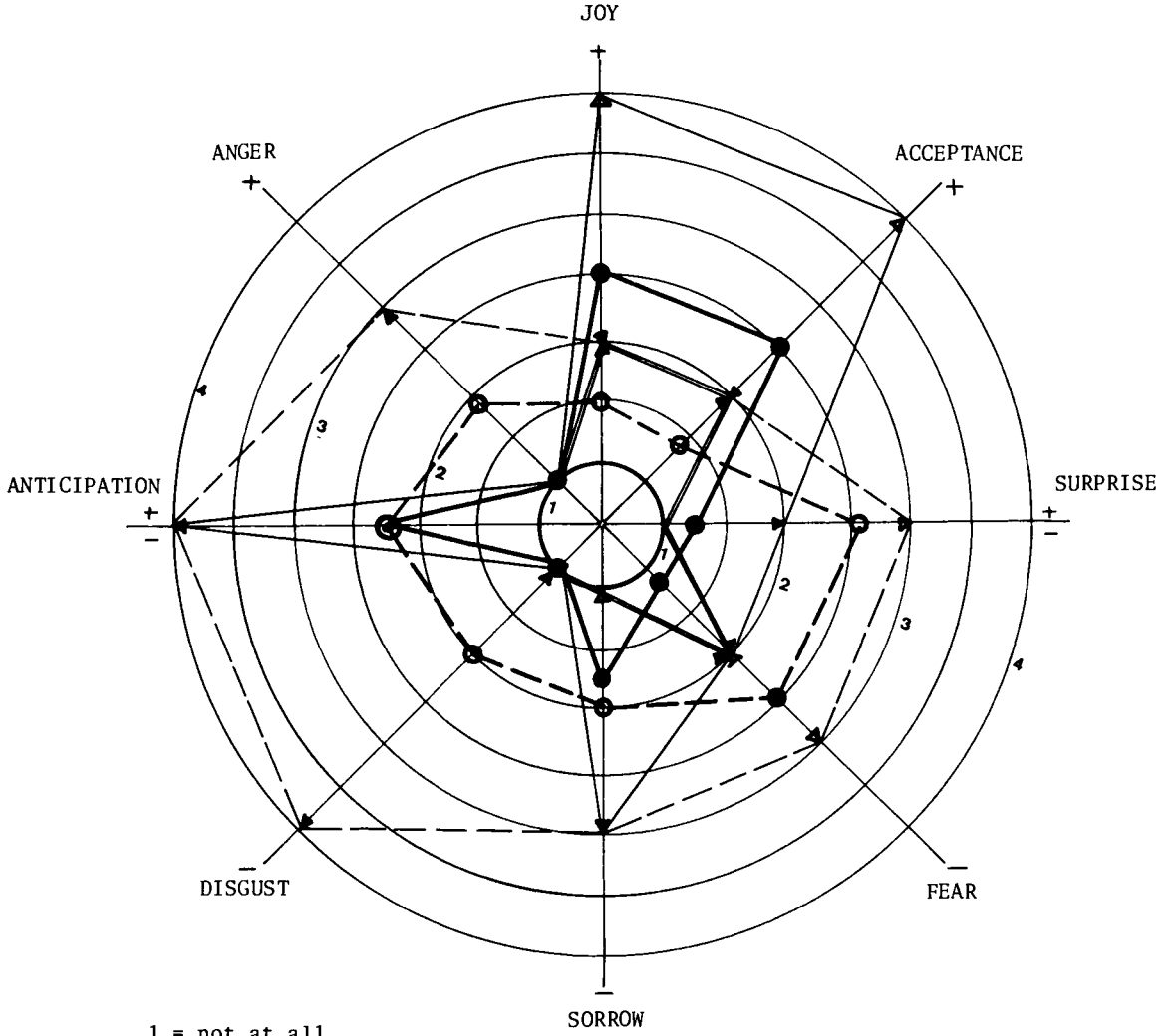
- 1 = not at all
- 2 = a little
- 3 = very
- 4 = extremely

Fig. 9



1 = not at all  
2 = a little  
3 = very  
4 = extremely

Fig. 10



1 = not at all  
2 = a little  
3 = very  
4 = extremely

Fig. 11



# Privacy and Crowding — Their Meaning in the Urban Context

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One of the important new trends in urban planning is the involvement of urban planners in the new interdisciplinary field of Person-Environment Studies. Within this interdisciplinary framework planners come into contact and exchange ideas with professionals from the social sciences who are involved with exploring the interface between the individual and the physical environment. Through this interchange we are attempting to bridge the gap which presently exists between our separate professions, and to create a shared body of knowledge phrased in terms which we all understand in similar ways. All those who have attempted this, know that it is no easy task. It is, however, an essential step in the process of forming interdisciplinary planning teams which can successfully work together.

Environmental psychology is interested in the mutual interconnections between the individual and his physical environment and the implications of these connections to behavior on the one hand, and to design or planning on the other. As an environmental psychologist I am concerned with the continuous interaction between the elements of the environment; in other words, with its individual-personal, social and physical aspects.

A basic premise is that the environment within which one operates is a psychological environment which is composed of three facets:

1. The physical setting in all its sensory aspects and including the people in it: structures, relationships, spaces, objects.
2. The social and cultural definition of these physical settings - what their purpose is? How one is to behave? What roles people have?
3. The individual, personal perception - understanding and interpretation of the other facets and one's relationship to them.

In other words, the "objective environment" is not identical with the psychological environment, and it is as part of the psychological environment that we behave the way we do (Churchman, 3).

It follows that design and planning of the physical facet must take the other two facets into account, if we are to achieve the purpose of providing environments that fit the people and functions for which they are intended.

I want to discuss two central concerns within the field of environmental psychology - the interrelated spatial concepts of privacy and crowding, and what their relevance is to public urban spaces.

Privacy does not mean merely wanting to be alone, nor can it be seen as a general and generalized need. It is much more complex. Most basically, it is concerned

with the management of interpersonal contacts and of the communication of information. Within the aspect of the management of interpersonal contact, we can elaborate and say that interpersonal contact refers not only to the relationship between one individual and another or others, but also to the relationship between a group of whatever size and others. What kind of contact is preferred, will depend upon the relationships between the people and the nature of the relevant activity and setting.

To this must be added the aspect of desire for control over the communication of information in a two-directional sense. In other words, it is not only a matter of what others know about us, but also of what we know about others. We may in some situations not want to be seen or heard or smelled, but we also may not want to see or hear or smell others.

A critical aspect in determining whether or not a situation is one of privacy is the element of choice. Isolation, while it is the state of being alone, is not privacy, because it is not voluntary - it is forced upon one.

Privacy is thus the momentary end result of a dynamic, voluntary process of interpersonal boundary regulation. The interpersonal boundary regulation may serve one or more of the following individual or societal functions - emotional release, self-evaluation, personal autonomy, concentration, freedom of behavior, status definition or perseveration of the group or society by allowing people to escape from its dictates at certain points (Altman).

The fundamental assumption of this approach is that specific definitions, expectations and demands for privacy will vary culturally, individually and situationally.

If we start with the situational aspect and compare a home with a public urban space we are clearly dealing with two environments that differ greatly not only in the kinds of privacy achievable there but also in the kinds of privacy expected and wanted there.

There are differences:

- in the physical surroundings;
- in the number of people and who they are, whether known or unknown;
- in the expected level of control over the situation;
- in the legitimacy of attempts at control and in the means of control available;
- in the behavior considered acceptable.

There are also cultural differences in the attitude towards these public spaces. In some cultures sexual behavior is acceptable in public, in others not. In addition, there are individual differences within each culture in terms of how people react to these norms of behavior and to the situation itself.

Thus, the social and environmental conditions of privacy and the means available for achieving them in public urban spaces are not equivalent to those expected or available in the home. This does not mean, however, that no kind of privacy is achievable in a public area. In fact, some kinds of privacy are more easily attainable in public urban spaces. An example of such a kind of privacy is anonymity, which is control over the information that people have about oneself and freedom of behavior achieved through the fact that no one knows who one is.

Privacy in urban areas may be much more a case of boundary regulation between relative strangers rather than with regard to boundary regulation between friends or

relatives or associates. As such, this kind of privacy may serve different functions and may be less ego-involving than privacy with regard to friends.

The means by which one attains a desired level of privacy are varied:

1. Physical elements - rooms, walls, curtains
2. Distance
3. Cultural norms related to these physical elements - what does a closed door mean? Does one knock or not? What distance is sufficient to guarantee privacy?
4. Verbal and non-verbal communication - what you say and how you say it - voice level, how you sit and stand, eye contact, dress - one function of uniforms may be to make the person a public figure and take away his private face.
5. Time scheduling
6. Psychological withdrawal.

For example, what can we do to try and achieve some amount of privacy in a bus? Turn away, whisper, contract our body, avoid eye contact, put something on the seat next to us.

In other words, there are physical-environmental, behavioral and psychological means to achieve privacy. The designer or planner can only affect the physical-environmental means but he must be aware of the other means, and take them into account in order that these physical elements complement rather than interfere with the behavioral and psychological means.

Given the fact that we are discussing a continually changing, subjective process, there can be no one design that fits all situations or all people. Therefore, design elements and spaces must be flexible and varied.

In a small research project done for a graduate seminar, Wesley Doe asked people in two neighborhood parks - "What does privacy mean to you in a public park?" They answered as follows:

<u>Number of people</u>	<u>Response</u>
6	sit alone
6	sit with friends
5	enjoy the park
2	do what I want
2	undisturbed
1	peace and quiet.

A park or a plaza should have spaces or corners which:

1. vary in the degree of their separation from other spaces - this can be achieved through landscaping, differences in levels, distance in the direction they face.
2. the spaces vary in dimensions, so that different size groups may be able to achieve a degree of intimacy in them - a couple or a family on a picnic.
3. the spaces allow for social interaction through such things as the arrangement of seating elements and of nooks which allow for solitude.

4. the spaces are appropriate for different activities, located in such a way that one does not interfere with the other (Churchman, 3).

Or there could be different parks with different characteristics and styles.

Another study done for that graduate seminar by Robert Judowitz was concerned with privacy on the beach. He compared three beaches on the same strip of the Haifa shoreline, a closed pay beach, an open - free beach and a "wild" beach with no lifeguards. These three beaches differed in ease of access, facilities, and the number of people using them.

He found that only a limited number of users desired privacy in a beach setting. For most people, other values were more important in this setting. But those who did value it were able to use space - go to the wild beach - and time - go on Thursday and not on Saturday - to attain their desired degree of privacy. This, because there were different kinds of beaches from which to choose.

One aspect of urban life on which we have relatively little information is whether public spaces are used for privacy purposes by people who cannot attain privacy at home. There are studies that show that husbands and children spend less time at home when they live in overcrowded conditions. In an interview study on the meaning of privacy for children conducted in a suburb of Haifa there was virtually no mention of places outdoors as a private place (Churchman, 1). Interestingly, however, in another small project, Isaac Shnell found that 40% of the kibbutz children whom he interviewed said that they had private places out of doors while 40% said they had no private place.

This would suggest that we need more such spaces in poorer areas to relieve some of the pressures inside the home - by, for example - giving more opportunity to children to get out of the house and play outside. Unfortunately, an examination of the situation in development towns in Israel done for the Hill-Alterman study of land norms (and this would probably be true in most large cities) showed the opposite relationship, with fewer parks and playgrounds in the poorer areas.

From the mention of overcrowded homes we can move to a discussion of the second concept - crowding. One of the conditions which may arouse a feeling of crowding is when the presence of others prevents the desired control over interpersonal interaction, or privacy.

Crowding is defined as the psychological experience of discomfort or dissatisfaction associated with a negative evaluation of a given density condition. Crowding is thus distinguished from the common planning concept of density - people per area or housing units per area - and this because density applies only to the physical facet of the environment (and this in a very inaccurate approach), whereas the concept of crowding takes into account all three facets - the physical, socio-cultural and individual. Density is more or less neutral. Crowding is defined as a negative experience.

In a questionnaire distributed among Israeli university students we asked them to describe the feelings they have in crowded situations. No one described positive or neutral feelings. They wrote of frustration, nervousness, lack of control, wanting to run away, a suffocating feeling and too much physical contact with others. A relatively small number talked in terms of lack of space. This illustrates the psychological experience of crowding which arises in a situation where the presence of others is perceived as limiting one's freedom of action.

This negative evaluation is subjective but it is influenced by physical, social, cultural and situational factors.

What is considered crowding in Tel Aviv may not be considered crowding in New York or Hong Kong. Whether the people with whom you are in close physical contact are known and liked or strangers will make a difference. So will the activity in which you are engaged, what the situation is and whether large numbers of people are expected and considered appropriate there.

It is important to stress that crowding is not synonymous with crowds. Some situations require large numbers of people in close proximity for their success - for example a party or a demonstration or St. Peter's Square when the Pope gives his blessing. In such situations the attendant density is evaluated positively rather than negatively, at least from the point of view of the organizer and the participant. On the other hand, it may not be evaluated positively by the residents of the streets taken over by the demonstration, or by the police who have to control it, or by the neighbors near the party. Again, when such a situation is evaluated positively or neutrally, it is not considered crowding.

This notwithstanding, large numbers of people and the possible attendant sensory overload are some of the elements which may contribute to a negative evaluation. The importance of this aspect of sensory overload is suggested by a recent study by Korte. In much of the sociological literature, high density has been perceived as one of the major characteristics of the urban area leading to loneliness, uncivility and indifference to the plight of others. Korte argues that the urbanite's apparent indifference to others may represent in part his adjustment or adaptation to the excessive bombardment of stimuli by his environment. He therefore chose for his study cities and towns, and within each type a high input and a low input area (input defined by sound level, traffic count, pedestrian count, commercial building count). Within these areas he tested people's helpfulness by:

1. asking them to answer a few questions for a survey study,
2. letting a key fall from his pocket apparently unawares, to see whether people would retrieve it for him or call his attention to it.

There were no significant city-town differences in helpfulness. On the other hand, environmental input level had a significant impact on helpfulness. In low input areas more people responded to the survey and more people retrieved the key.

Design and planning elements can attack this problem of sensory overload and thus aid in the minimization of feelings of crowding.

Rapoport argues that any physical cues which suggest many people increase the level of perceived density, and this may lead to the experience of crowding. Therefore, design features that reduce interpersonal perception - so that in the given situation we are not aware of all the people there - will aid in this regard. Also it is his contention that any design which reduces sensory inputs and cues from man-made aspects of the physical environment will serve this purpose - these excessive cues include signs, large buildings, many cars, large parking lots, many lights, sounds and smells. (One possible solution for parking lots could be to design them in smaller units and use landscaping and topography to screen them from view. An example is the Auditorium in Haifa where trees hide the parking lot and seen from the street, this gives an impression of a large open space.

Urban open space can serve these functions of reducing interpersonal perception and reducing sensory inputs if planned with this in mind. Landscaping and natural elements can be particularly useful in this regard, but they are not the only possible solution. Spaces can be created which offer relief from some of the demanding qualities of the city, without being complete retreats.

The character and size of an open space required in a particular area would seem to be related to the degree of sensory overload to which people in that area are exposed throughout their day - within their home, streets, shops, work, transportation and recreation. We must find a way to strike a balance between the positive and negative aspects of relatively large numbers of people. One way to do this is to provide enough services and facilities so that there is less competition for resources, and to offer a variety of spaces appropriate for different circumstances.

The critical element of this approach to both privacy and crowding is the fact that the definition and evaluation of each setting are subjective ones, though not idiosyncratic. The goal then should be to offer sufficient variety within the urban scheme so that each individual or group may find the setting congruent with their behavioral and emotional needs. Since these personal definitions are influenced by physical, social and cultural factors, the task is not an impossible one. There are many commonalities and shared aspects upon which to base a planning program and to choose that type of variety to offer.

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# **The Man in the Street: Notes on the Existential Meaning of the Street and its Spatial Implications**

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This paper deals with our experience of one type of place: the street and, more specifically, with the street as it presents itself to us as a concrete "here and now" environmental event.

What is a place? It is a zone in space in which a number of entities are related by some exclusive set of relations.

Entities reveal themselves to us in one of two ways: as independent objects perceived from the outside forming parts of an enclosing systems or as objects perceived as from the inside of a place as systems of related entities. Any system is experienced from the inside as a place, be it a mathematical formula or the body of a chicken.

Even by drawing a circle on the surface of this page I create a place: all points inside the circle share the exclusiveness of being inside this circle, of which there is only one of the kind and of which, by definition, there can be no other.

What we are interested in, of course, are not the places inhabited by the imagination of the mathematician or the scientist, but those inhabited by people and directly experienced by them. Here we find ourselves always within some place (when not sound asleep or in a coma) which reveals itself as a zone in space, inside a hierarchy of places. In this zone in space we interlace with other entities: people, organisms, things. Some of these entities are on the periphery of the zone and actually create its boundaries: trees, walls, a parasol. Some are nearer to its center, engulfed by the zone.

Our understanding of the experience of places is hindered by the concept of a "physical environment". Nowhere in our direct experience do we find a "physical environment". We find things, objects, but all entities in the place - animate and inanimate, reveal themselves as objects, as spatial entities, in their concreteness.

We experience the place as the embodiment of the overall environment, and we experience the event we undergo at that point in time/space. The place itself being a system of objects interrelated into sub-places, engulfed by the ambience - the light, smells, warmth of the atmosphere enclosed in the space zone.

The theoretical approach and terminology employed in this paper are those of Eco-analysis. The ecoanalytic method attempts to explore the meaning underlying our experience of places. "Meaning" implies in this context, the fundamental (I-world) relations which are experiences while occupying a certain place or type of place - on its own, or as part of a hierarchy of places.

It is assumed that at any given point in our life's continuum we attempt to generate a pattern of (I-world) relations which, through compensation and reinforcement, combines with our experience of other places, to generate a certain overall I-world balance of relations which we attempt to achieve.

Each place is experienced by the observer as having a potential of relations, of generating a certain meaning, to which he will respond according to his overall life plan.

After interpreting the potential of meaning that a place holds for a person in a given role, Ecoanalysis proceeds to study the part played by various spatial characters - size, enclosure, ambience, etc. in generating this meaning.

In this analysis of spatiality, the fundamental postulate of Ecoanalysis is that we experience all systems as bodies or, more precisely, as metaphoric representatives of our own body<sup>1</sup> and we tend to project the construct of our own body - our experience of its size, texture of envelope, direction, etc., to the spatiality of metaphoric bodies - to the spatiality of places. We endow places with identities: purposeful, coherent entities possessing certain characteristic potentials - we construe them as metaphoric persons.

The identity of a place is experienced as reflecting on the identity of the institution it belongs to. Through the creation of places, society transmits the goals and values of its institutions. Spatial aspects like the size and occupancy of space zones, enclosure and exposure or warmth of ambience, are experienced as aspects of the institution to which the place belongs - its dominance, degree of self-sufficiency, the involvement expected from participants.

Institutions reveal themselves to us as places, and in the operation of places. Be it "a school" or "family", the pattern of socially defined relations we call "institution" is experienced as a sequence of environmental events, as a sequence of places:

Being in this school,  
Being in this classroom,  
Playing in this courtyard,  
Living in this street,  
or Seeing this landscape from my window.

Places are not enclosing institutions, they are the embodiment of institutions. The school area including all its buildings and courtyards and all its occupants is the embodiment of the school institution.

A human settlement is the embodiment of a human society, it does not enclose it, it is that society.

When places are socially defined: a place to learn, a place for the family to dwell in, etc., they are experienced as the embodiment of social entities: of school, family, etc. The expectations and attitudes, brought by the participant to his role in the institution become critical factors in generating his relations with the places or type of places in which the institution is concretized.

Only by analyzing the underlying meaning of the role - the I-world relations implied by it, can we understand the occupant's relations with the place and its spatial parameters. It is only by understanding the roles of::

Being a pupil at school  
Attending classes



Playing during the intermission,

that we can draw any meaningful conclusions on the quality of the places of "school", "classroom" and "courtyard", respectively. Understanding the role of "being in the street" and revealing its meaning, is crucial to understanding the street as a place and the meaning of its spatiality.

Streets - the category of places which are defined as streets, form part of the super-ordinate entity of the settlement. They are defined as streets mainly according to two criterions: They are public domains and they facilitate transit. As such they are the most direct link between the citizen and his settlement, between man and his society as a whole. All other domains involve the additional intervention of public or private groups. Only in the street is one purely and simply "a citizen". Hence the term of "the man in the street" which tends to indicate the average citizen, the people; non-adherence to any specific institution or power group in the settlement/society is thereby clearly indicated. If one is to understand the role of "being in the street" one has to go back to the role of "being a citizen".

What characterizes these relations in our society is an underlying detachment, indeed - at times - alienation. Our relations with society as a whole tend to be functional, expedient. We do not identify with it, we tend to keep to our individuality.

The settlement no longer commands the degree of involvement and identification which in the past characterized the medieval city or the village. This fundamental detachment is transmitted from the settlement to the street - it is a place where one has no responsibilities, no alignments, no duties, where one gets neither support, nor is one suffocated or demanded upon. The street situation provides a sense of exposure, of freedom, of non-involvement.

One is purely a citizen, who is expected to be loyal to the state, pay his taxes and abide by the law. Being a citizen of a welfare industrialized state, means also that a sense of security is enjoyed, a sense society is expected to provide, - a society that is mainly a providing, hedonistic entity. The street as the most direct exponent of society is a place where one expects to consume, to play, to enjoy oneself, its image is that of a fair where "everyone has a good time", rather than that of a promenade where one is out to socialize, to observe and be observed and appraised.

In small traditional settlements, going out into the street, meant entering the space zone of an intimate, involving social entity: one was being observed and judged by one's betters and peers. What occurred there, was to some degree one's own. The street was a strong intermediary with which one could identify. In the welfare state one goes out to escape intermediacy, to avoid responsibilities. One has open options: to get involved in various institutions or to keep away from them. One is a consumer of goods and of the facilities provided by the settlement, be it lighting, road safety, gardens, or the view of merchandise and people.

As to the relations between settlement and nature, we witness in our time a topological inversion. While historically the settlement was a man-made shelter against hostile natural and human forces, today the man-made environment has engulfed the entire earth in a network of roads and settlements. The natural landscape is besieged, surrounded by the man-made features; it has become a multitude of enclaves, to be defended against the expanding forces of industrialization and urbanization. For the modern citizen, the settlement is not an entity in which he finds refuge, it is an element of a man-made system which, while providing support and well-being,

generates a feeling of over-dependence and, as a result, a need to escape, to come face to face with nature, without the intermediacy of the settlement.

In the street this underlying wish to escape to nature imparts to all man-made elements the meaning of over-involvement and of being controlled by society, while natural elements - the sky, trees, unpaved earth, generate a sense of independence, of freedom. The reaction to this capacity of the street to generate the feeling of exposure, independence and enjoyment depends on one's values.

Indeed, various design approaches current today are a result of conscious or unconscious attempts to provide an emotional response to this underlying meaning of being-in-the-street. Before we continue, it therefore seems necessary to make clear the author's own values in his interpretation of the street.

We witness in our industrialized welfare societies and their embodiment as settlements a continuous attempt to come to terms with the challenge of what can be defined as "the large numbers": population explosion, energy, information. The large numbers generate alienation and chaos, as well as a potential of richness and complexity. Structurally, there are three ways to deal with large quantities:

1. To amalgamate the units into one centrally controlled, homogeneous whole - what I will call the bureaucratic approach.
2. To segregate the units into small groups which have less potential but are more intimate and easier to handle and coordinate - this approach I will call romantic.
3. Finally, to accept the challenge and create a hierarchy of relations between the units which will integrate them into a system of wholes while keeping their specific identities. This approach I will call open or integrative.

It is this last approach which I make my own, since I see in richness of experience a fundamental value. The bureaucratic approach manages to insert "law and order" into the system at the price of its potential richness. The romantics want basically to regress to a former less complex system, with which they know how to cope and which will provide them temporarily with a sense of harmony, but at the price of stagnation and eventual decay. It is only the integrative outlook which holds the promise of extracting a new richness from the challenge of the awesome, large system.

The integrative approach advocates therefore, the acceptance of the street's potential of detachment, receptivity and independence, without trying to dissolve it into the settlement and its institutions, nor to relate it strongly to local homes and institutions, but attempting to give it a definite identity as a neutral place, a place of getting away uninvolved, a place through which the citizen can relate directly with any of the institutions or homes in the settlement.

One should accept the dissolution of old intermediacies and the position of the individual as directly confronting society, including its institutions and nature in its various forms.

Having stated this position, let us look at the way the three approaches are employed in dealing with the street.

Applied to the settlement, the integrative approach accepts its complexity and does not attempt to reduce it either by central control or by subdivision. In his book, "The Uses of Disorder", Sennett<sup>2</sup> points towards this potential of the

modern settlement to involve the individual directly in a variety of relations and institutions and to enhance its potential of enriching experience.

The street has an important role to play in permitting freedom of choice and reducing the intermediacy of the "community". It provides the individual with physical access to all institutions and provides him with a role in which he has no strong commitments. There is a minimum of intermediacy between himself, the settlement and nature. It embodies his position as a free agent in a complex, welfare society.

The current tendencies in the design of settlements and their streets - the public domains, are the bureaucratic and the romantic. The bureaucratic approach accepts the existing state of affairs - the expediency and alienation -- and attempts only to solve the operational problems. This approach has become so discredited by now, that to attack its products is as good as flogging dead horses. The anonymous housing estates, the chaos of "functional" motorways, street lights, electricity cables, fenced-in institutions, etc., speak for themselves.

The romantic approach, on the other hand is dominant and still enjoying an avant-garde status among designers and planners. As I am critical of its values, while agreeing to its attack on the bureaucratic approach, I will concentrate on romantic designs of the street and on the alternative integrative solutions. What these designs attempt to recreate basically, is the small community. How is this attempt reflected in the design of streets?

As the metaphoric body of a "public domain", of that pattern of relations that we call "being-in-the-street", the spatial features of the street generate a potential of meaning, of certain I-world relations. Of all spatial features, those dividing space are the most fundamental ones and are also the ones on which designers have the most long term influence.

The division of space generates various degrees of intermediacy among places, various degrees at which the identity of one place is experienced as being related to the identity of other places. Through the manipulation of the features of space division, a designer can influence the range of alternative meanings available to the person in the street, to the man experiencing himself as being in the street.

Let us look at some of these features and at the way they are employed by the romantic and by the integrative approaches, in order to compose, amalgamate and segregate the identity of places.

#### INCLUSION

The identity of a place is being transferred not only to its human occupants, but in various degrees also to other subordinated places included in its space zone.

The degree of transference depends on the ownership of the place - if the included place is owned or controlled by the same agent as the including one, the superordinate identity is more dominant.

Inclusion is experienced as an intermediacy. The including place operating as an intermediate identity for the included one. Spatially, intermediacy is generated by the inclusion of subordinate place A, inside place B, or on its periphery (a room in a house), as well as the occurrence of B above or on the horizontal of A.

### DEFINITION

The definition of the space zone's boundaries is sensed as an aspect of its self-sufficiency and stability. The higher the definition, the more is the place experienced as a self-sufficient and stable entity.

### DISTANCE AND DIRECTION

The distances apart and the relative direction of the least defined parts of the boundaries of places is experienced as generating a potential of integration between their respective space zones.

The closer place A is to place B, the more is the space between them experienced as one in which an interaction between A and B occurs. When the most exposed side of A turns towards B we experience the identity of place B as playing a stronger part in the intensity of A.

One of the most persistent romantic images is that of including the home in the space zone of a highly defined, spatially compact group. Together with other homes and various local institutions in the search for the lost unity of former small communities - the village, the medieval town, the romantic imagination proceeds to create symbols of unity.

In Le Corbusier's Unité d'habitation, this approach is given its first and most eloquent expression. Here we have the symbolic community, small, compact, in one space zone, a ship made of concrete, where "all one's necessities are provided for", sailing on a landscaped sea.

Overlooking the fundamental fact that modern man tends to create his relations not on a territorial basis (as long as he is economically and politically free), we have here a village, symbolically created and grafted on an industrial modern society.

The town center "under one roof" employs a similar romantic approach in an attempt to redefine the relations between street and public institutions. While the existing situation, in which each institution inhabits its own separate zone and tends to promote separation and specialization, the megastructures dissolve the fruitful dialectic of street and institution into one monolithic amalgamate in which experience is impoverished.

One is over-controlled by the institution both in one's relations with nature and in one's freedom to be involved or detached from the system and its sub-places. There is a complete inclusion and the occurrence of a compulsive intermediacy. It is impossible to wander around as in the traditional street, now exposed, now sheltered from the sun, wind and rain, and to pick one place or another on one's way.

The open approach proposes a differentiation of places and their integration into a higher, more complex whole. The street - the public domain and the home - the private domain should be treated as independent entities.

The best illustration to this approach can be seen in the redesign of old buildings. The envelope which is part of the street as well as of the house and its various apartments, is kept intact, while the interior is redesigned and modernized. In this way, the continuity of the street - the public domain - is achieved, and through it the continuous intervention of historical values (and of continuity itself as a value) as embodied in the spatiality of this envelope. At the same time,

the individual home - the private domain - is free to create its own place. On applying this formula to the streets we design, one should attempt to create a stable envelope, while leaving the space zone of both street and home open to change and initiative.

Another image which the romantics attempt to transplant to the modern settlement is the Mediterranean village. Its narrow, white-washed streets stone paved, colourfully detailed, provide a feeling of intimacy and acceptance. The social relations, however, which these places embody, no longer exist and cannot be revived.

The narrow street was relevant to societies in which the public domain was either inside a tightly knit group of kinship relations, or a no man's land separating and linking the territories of such groups (see the ethnic groups and Hamulas of the oriental city).

Today the street belongs to society as a whole, and its narrowness creates over-involvement with the homes and the immediate neighbourhood, diminishing the street's potential to offer freedom and detachment. Intimacy should be created inside the street in some of its sub-places and not as an overall condition.

The narrow street generates also a narrow sky. The openness of the street's boundaries to the sky is diminished, reducing the part the sky plays in the identity of the street. It diminishes the potential of the street to relate to nature and to the world - detaches the man in the street from his commitments and the intermediacy of institutions and the man-made settlement itself.

The rooms and balconies overlooking the street provide shadow and shelter, but also generate the intermediacy of institutions to which these places belong - the homes, between the street and the world - an intermediacy which again is unrequired when relations of non-involvement and freedom are sought.

The hard surfaces and space vegetation employed in the Mediterranean street were an outcome of the "settlement-besieged-by nature" situation. The inversion of this topology today, mentioned above, has made the hard surface approach anachronistic. It diminishes the receptiveness of the street, inherent in soft, organic materials and it reduces the contact with nature and therefore its freeing potential.

As a contrast, let us look at a sketch for a square at Recife, Brasil, designed by Roberto B. Marx. Here trees and flowers are not planted in the square, they are the square.

Finally, a last example of romantic thinking - the pedestrian street. The menace of technology looms large in the romantic imagination, since its first manifestations in early 19th century. Its reaction was always one of denial and search for refuge. The same applies to its response to the motor car. It creates pedestrian enclaves, sanctuaries of safety, surrounded by the dangers and pollution caused by the roads that enclose it. The approach by car is seen as a service entrance. The ceremonial approach is exclusively that of the pedestrian.

The segregation of pedestrian and motor traffic creates a state of siege. Some part of the experience is rejected as unmeaningful, secondary, dirty and dangerous. The layout of the new town Hook, is one of the first and most articulated statements of this approach. The richness of experience is diminished, sometimes visibly - when "pedestrians only" places remain empty, while improvised activity occurs in undesigned places near the car access. But the most important damage is more subtle: the sheer division and specialization of routes generates a model of

man-in-the-world in which the dependence on some outside mechanical system is reinforced in the most routine and frequent acts of one's life. The inherent submission and necrophilia becomes an integral part of the daily schedule.

The integrative approach attempts to tame the motor car, not to banish it. It attempts to integrate a slower, more leisurely driving with walking, playing, etc., into one continuous street place. Some experiments in this direction have been made in city centers, where the routes of public transport and pedestrians are reintegrated. Another important example is the redesign of existing residential streets in some Dutch towns. The routes for cars have been redesigned so as not to promote straight-line driving. The street pavement is unified with only slight variations to indicate the car route. Gardens, playgrounds, parking facilities are integrated in the same street place as the car route.

### CONCLUSIONS

This paper is concerned with the formulation of hypotheses on the experience of the street. We felt that their formulation is a necessary precondition to any meaningful study of being-in-the-street and its spatial implications.

At the Ecoanalysis Laboratory we are now involved in a series of studies in which these hypotheses are tested. The studies involved interviews in depth, in which a battery of tests are applied to various groups of informants. Our understanding of the street will however, ultimately depend on the discussion and debate of hypotheses and value positions and the use of a variety of research techniques.

### FOOTNOTES

1. For a more detailed discussion see, A. Peled, "The Place as a Metaphoric Body", Faculty of Architecture, Technion, Israel, 1976.
2. Sennett, Richard, The Uses of Disorder, Penguin, 1970.

## Introductory Note

In the policy of planning the development of arid zones, new trends are discerned by Dr. Gideon Golany in his paper on the subject of "Policy Trends in, and Proposed Strategies for Arid Zone Development". The new trends, the author states, show a direction away from rural settlement, in favor of urban settlement. These trends call for new strategies to be followed, and these are outlined by Dr. Golany, with particular reference to the type of arid zone which has a hot, dry climate throughout most of the year, and low precipitation which is insufficient to support dry farming.

Such arid lands possess a potential for agriculture under special irrigation, for recreation and tourism, for supplying energy (solar and wind), for mining and particularly for new urban settlements.

Dr. Golany proceeds to indicate the direction that should be taken in selecting new strategies for settlement patterns. Such strategies should be adapted in every particular case to the specific area and culture under consideration, with a view to ensuring economic development, meeting social and health needs and providing for further comprehensive research in the course of their implementation.

A specific application of these strategies is proposed by Prof. Haim Darin-Drabkin in his paper on "Regions and Growth Poles: The Negev as a Case Study". The author stresses at the outset the vital role of long-term planning in small countries such as Israel, with high local concentrations exemplified by the country's coastal strip. He recommends a newer balanced development of the country's region and dwells, in the continuation of his paper, on the great development potential of the sparsely populated Negev.

The climate of the Negev is in many respects preferable to that of the coastal strip, though the winds in its mountainous region do affect human comfort. The effects of wind, however, can be minimized by appropriate construction and city planning methods.

Prof. Drabkin indicates the opportunity available in the Negev to create a well-planned urban-industrial complex for 5 to 6 million additional inhabitants in the future. The creation of a new large-sized urban-industrial region may prove to be of importance not only to Israel, but also to other countries when large parts of the population are concentrated in small urban areas.

A still more specific aspect of planning in arid zones, characteristic for the hilly parts of a desert region in a hot climate, is taken up by A. Rachamimov and M. Cones in their joint paper on "Planning Settlements for Upland Arid Regions: An Overview of Environmental and Building Considerations".

In taking up their particular subject, the authors point out the special difficulties encountered by settlers in hilly arid areas. These include high temperature

fluctuations between day and night, intense winds and low rainfall, and also a psychological difficulty - that of isolation.

To overcome these unfavorable circumstances or, at least, to reduce their effects, the authors present a number of practical proposals. To start with, the site of the settlement should be carefully selected and a high building density of 12 or more dwellings per dunam (1000 sq. m.) should be adopted, while avoiding long walking distances. Windbreaks built as walls or formed of trees are very desirable. High rise buildings are not recommended, since they cause air eddies and dust raised by wind.

Lying mostly far away from centers of water or electricity supplies, upland settlements should pursue their local self-sufficiency as well as conservation. Solar and wind energy should be utilized, consumption of water reduced, coupled with the recovery and use of water.

To reduce insolation in the summer and to gain more of the sun's warmth in the winter, the long axis of buildings should be placed in an east-to-west direction. A double or "parasol" roof with an intervening air space will reduce overheating of the houses in the summer. Other essential particulars are the need to ensure cross-ventilation, provided openings can be tightly sealed when necessary against dust.



# Policy Trends in and Proposed Strategies for Arid-zone Development

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## INTRODUCTION

Our discussion of arid zones is primarily concerned with the type characterized by a hot, dry climate where the average rate of precipitation is much lower than that of evaporation and does not support non-irrigated farming, where the rate of radiation is high -- especially in the summer, and where the amplitude between day and night temperatures is very high.

The importance of this arid zone lies in its potential, as Table 1 shows, for agriculture, for recreation, for supplying energy (especially solar and wind), for good air navigation, for mining of natural resources, and most importantly for the establishment of new settlements. The significance of the different types of arid zones can be seen if we consider their position on our globe: half of the world's nations are composed entirely of or include within their borders an arid zone, 15 percent of the world's population and one third of its land mass are in the arid zones, 22 percent of all potential arable land (700 million hectares) is in the arid zone, and, finally, most of the world's oil reserves are within arid land.

## POLICIES FOR ARID-ZONE DEVELOPMENT

Arid zone development has taken place since man's earliest years. Many of the most impressive civilizations developed throughout history have been in the hot, dry arid zone. Among those are, of course, the hydraulic one of the Middle East. Today, much of the arid zone's population is concentrated in poor, developing countries. Nonetheless, this population's existence has necessitated the formulation of policy at either the national or the regional level.

### Traditional Policies

The traditional policy for arid development, one commonly adopted by many of the world's arid countries, has been focused primarily on the following:

1. Either coexistence with the nomadic population, with support or subsidies provided to the nomadic economy or, sometimes, an attempt to resettle the nomads without a substantial comprehensive plan.
2. The exploitation of natural resources for economic benefit (to the public and the private sector) without the preparation and implementation of a comprehensive plan capable of avoiding environmental depletion and improving local residential life.
3. The use of the arid and semi-arid land for agricultural experimentation (food production) under very risky conditions.

TABLE 1 Arid Zone Resource Potentials and their Usage

Resource Potential	Usage	Associated Issues
Agriculture	<ul style="list-style-type: none"> <li>*Production of food               <ul style="list-style-type: none"> <li>- with dripping irrigation</li> <li>- in greenhouses</li> </ul> </li> <li>*Production of livestock feed and graze</li> <li>*Development of industrial agriculture</li> <li>*Establishment of fisheries               <ul style="list-style-type: none"> <li>- with brackish water</li> <li>- with sea water</li> <li>- with recycled or mixed water</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>*High cost of water</li> <li>*Necessity for highly regulated water supply system</li> <li>*Possibility of high wages for imported labor</li> <li>*Low priced land with high fertilization requirements</li> <li>*Requirement of advanced technology</li> <li>*Good market during off-seasons</li> <li>*Provision of more than one crop per year</li> <li>*Development of food factories</li> <li>*Support of a healthy economic base</li> <li>*Stabilization of employment</li> <li>*Strengthening of regional cooperation</li> <li>*Stimulation of development of infrastructure</li> <li>*Possibility for artificial water bodies with improvement of climate</li> </ul>
Recreation	<ul style="list-style-type: none"> <li>*Centers for tourists               <ul style="list-style-type: none"> <li>- for archeological sites</li> <li>- for unique geological parks</li> </ul> </li> <li>*Areas for hunting</li> <li>*Health centers for asthmatics, arthritics, etc.</li> <li>*Recreational facilities for vacationers</li> </ul>	<ul style="list-style-type: none"> <li>*Need for improvement of transportation, social services, facilities, hotels, restaurants and other amenities</li> <li>*Investment for infrastructure</li> <li>*Potential for seasonal economy</li> </ul>
Solar Radiation	<ul style="list-style-type: none"> <li>*Development of dehydrated food industry</li> <li>*Production of energy               <ul style="list-style-type: none"> <li>- solar energy to electricity</li> <li>- solar ponds to steam for low pressure turbines</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>*Necessity of technological advancement and skill</li> <li>*Reduction of daily household electrical consumption</li> </ul>
Wind Energy	<ul style="list-style-type: none"> <li>*Energy for household consumption</li> </ul>	<ul style="list-style-type: none"> <li>*Instability of supply</li> <li>*Support of early independency</li> <li>*Reduction of imported energy</li> </ul>
Air Navigation	<ul style="list-style-type: none"> <li>*Crossing routes and centers for national and international navigation</li> <li>*Centers for military and civilian training</li> <li>*Stations for astronomic observation</li> </ul>	<ul style="list-style-type: none"> <li>*Visibility of pollution and increased negative effects of pollution</li> </ul>
Mining	<ul style="list-style-type: none"> <li>*Centers for exploitation of natural resources</li> </ul>	<ul style="list-style-type: none"> <li>*Possibility of environmental deterioration</li> <li>*High cost of infrastructure</li> </ul>
New Settlements	<ul style="list-style-type: none"> <li>*Centers of urban development</li> <li>*Villages of agrarian-industrial labor and families</li> <li>*Villages for recreational facilities</li> <li>*Villages of mining labor and families</li> </ul>	<ul style="list-style-type: none"> <li>*Support of infrastructure of the villages in the region</li> <li>*Necessity of research on the suitable settlements and configuration of houses</li> <li>*Necessity of construction of lengthy and expensive infrastructure</li> <li>*Reduction of nomadism</li> <li>*Population issues of interregional shifts</li> <li>*Improvement and stabilization of economy</li> <li>*Seasonal fluctuation of population</li> <li>*Improvement of services</li> <li>*Disruption of ecology and environment</li> <li>*Insecurity of economic base</li> <li>*Transience of population and culture.</li> </ul>

4. With the exception of a few countries, little or no research in the development of the arid zone.

5. An autarkic economy, which is by definition not export-oriented.

As a result of these characteristics, for the most part, stagnation and low economic growth were unfortunately dominant.

### New Trends

It has become clearer and clearer in many countries in the arid zone that the zone's potential is not primarily to be found in agriculture where the land and the scarce water pose problems. Rather, the potential is for heterogeneous land uses with agriculture being only one possibility. In addition, it has also become clear that agriculture in the arid zone necessitates highly sophisticated technology and, above all else, comprehensive planning of the entire region so that other economic activities within the region can support agriculture's revival. Among those activities can be industries related directly to agriculture (such as food packaging industries), services and amenities required by agriculture including the construction of infrastructure and its maintenance and a transportation system guaranteeing supply and delivery through a marketing network.

A second new trend in arid-zone development policy has also resulted in a large diversion from agriculture toward the exploitation of energy resources. This has especially taken place after the world fuel crisis of 1973. One of these new resources is solar energy, the freest, most readily available, and most unlimited energy in the arid zone. (To a lesser extent attention has been drawn to the potential of wind energy which is also available in many regions in the arid zone.) Although more research and technology are needed to develop sophisticated and economical systems permitting the large scale utilization of solar energy in industries and services, it is already evident that we are able technologically and economically to use solar energy on a household scale. A dehydrated food industry using solar energy now exists in the United States: it points to the future possible uses of solar systems beyond the level of the individual dwelling.

The third new policy trend in arid-zone development is the building of new settlements, especially urban ones. The growth of old urban settlements is rapidly taking place. Phoenix and Tucson, Arizona, for example, are the most rapidly growing cities in the United States in the past decade. And cities have been built in the arid zones of Iran, Pakistan, Israel, and Australia. However, the lack of sufficient knowledge in planning and constructing cities in the stressful climate of the arid zone is extremely noticeable. Considerable research and experimentation is needed if we are to attain sufficiency and establish acceptable norms for arid-zone planning and building. In doing this, we have one major asset: the lessons to be learned from the cities built by the ancient civilizations of the arid zone.

This third new trend also entails the development of a wide variety of settlement types in the arid zone: urban centers, agrarian-industrial villages, recreational villages, mining (but not isolated) towns, and finally settlements planned on a regional basis which feature mutual interrelated economic and social services.

The fourth and a very important policy trend in the arid zone is the growth of tourism and recreation. With the increasing prosperity of the non-arid developed countries and their residents search for moderate and warm climates to spend vacations in, the arid zone has become a most attractive area. Developing countries located in the arid zone will thus find recreation an important ingredient in their

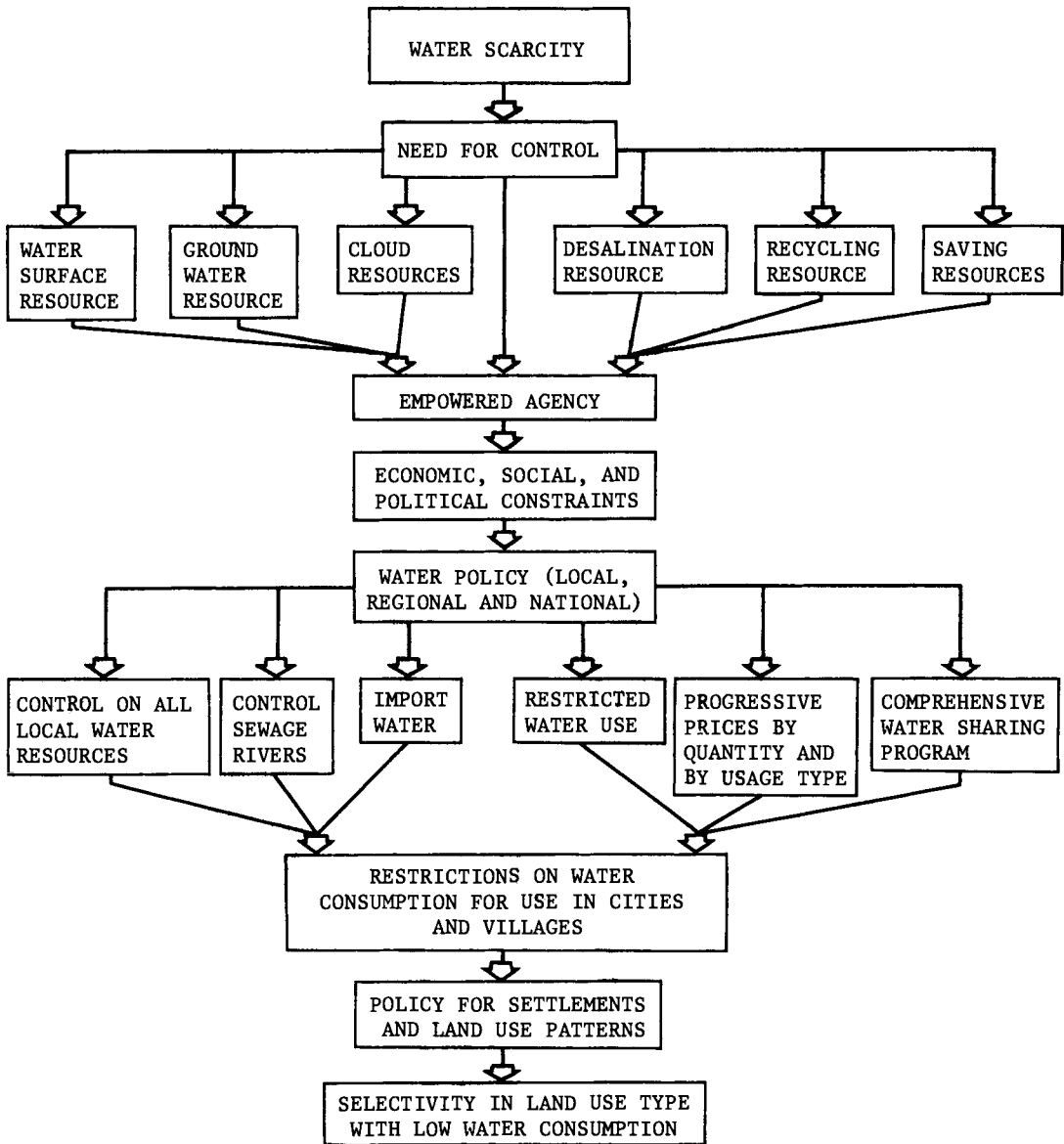
economies. This new trend will be accentuated by the shifting of the vacation season from the traditional summer to year-round. Tourism has also been and will continue to be attracted by the archeologically fascinating sites of ancient settlements.

In general, these and other new trends in the development of the arid-zone point to the following recommendations.

1. The economy must be diversified and not solely dependent on agriculture and the dominant natural resources.
2. Resources (such as the climate), which have been re-discovered in the arid-zone and are beginning to be developed, should be further exploited. Also, some economic activities (such as the electronics industry), the resources for which are not available locally, should be brought into the region to support its economy.
3. Comprehensive planning is necessary for the proper development of the region.
4. Neither public investment nor private investment will dominate in the development of the arid zone. Rather both must jointly or separately be involved in any new venture.
5. Developers must realize that the utilization or over-utilization of natural resources (oil, gas, etc.) of the region is not only a depletion of these resources but, due to improper treatment during processing, a cause of a serious threat to the environment. It thus is imperative to formulate and implement strict environmental protection codes. There must be more recognition that the arid zone is balanced at the threshold of survival as far as its flora, fauna, physical forms, and land quality are concerned.
6. Last, but not least, research on water desalination must be intensified in order to make more economical the production price of agriculture. Also, the existing tendency to use brackish local water mixed with fresh imported water should be evaluated, as should the new method of irrigating agriculture by dripping water on it and the new emphasis on greenhouse controlled agriculture. This last innovation has brought about a revolution in the planning and implementation, in the marketing and in cost-benefit analyses of arid-zone agriculture. This revolution may significantly raise the potential population of the arid zone. All in all, water resources, as Fig. 1 shows, still determine the bulk of the planning and development decisions. It is my belief that the importance of the water issue makes more emphatic the need for comprehensiveness in the planning process and for more control in the implementation, even in the private-enterprise economy, such as that of the United States. This control can be attained since the public sector is still a primary investor at the pioneering stage of arid-zone development.

#### STRATEGIES FOR ARID-ZONE DEVELOPMENT

As the recommendations made in the previous section were consonant with the recent trends we noted in arid-zone development, the specific strategies we will present in this section are necessarily related to the recommendations. This is only logical. However, since each arid region is a geographically and culturally unique entity, we cannot generalize as easily when discussing strategies as when making recommendations. Since by strategy we mean the marshalling of the region's resources in order to attain a specified goal -- a course of directed, planned action, in other words, it is evident that what can be done is dependent upon what resources --both natural and human--exist and what constraints--again, both natural and human--impede development.



### Strategies for Settling Arid-Zones

As we noted in the previous section, the traditional emphasis on agriculture has given way to a new one on multiple land uses. With this has come a change in focus from rural to urban. This has been, for example, the experience in the Negev in southern Israel where, now, the urban population is larger than the rural. We need to encourage this trend, and we must plan as economically-diversified a base for the arid urban settlements as possible, involving, especially, businesses and industries that are not particularly water-consumptive and tourism and recreation.

Erik Cohen has observed that two different types of populations tend to move into the arid zone. The first type moves there spontaneously and is pioneering in spirit; the second is sponsored--sent there to help realize national objectives--and is often less pioneering and thus requires that amenities dependent upon a sound infrastructure be quickly provided.

The construction of an infrastructure--i.e., water, power, communications, and transportation systems--is also a prerequisite to sound development, especially if the development is to occur on a regional basis. Thus, an infrastructure must be planned and built before or coincident with the early settling of an area. Since, to an extraordinary extent in the hot dry arid-zone, a given region's economic structure will depend on its infrastructure, its construction is imperative. The costs will probably have to be borne by the public sector. This, however, should not pose any unusual problems, since, even in free market nations such as the United States, infrastructure is a public responsibility. Since the settlement pattern in arid zones is typically sparser than in humid ones, the per capita costs of the infrastructure will be higher than in non-arid regions.

### Strategies for Selecting a Site and an Urban Form

Settlement and the construction of an infrastructure, therefore, must be at least coincident. This settlement and construction cannot, however, take place just anywhere. The site must be carefully chosen, and the more urban the settlement will be, the more important careful site selection becomes. Sufficient land, water, accessibility, employment potential, and comfort are five very important criteria.

As important as selecting a proper site in the final analysis, is choosing an appropriate urban form. As we already noted, the typical dispersed settlement pattern in the arid zone increases the initial and continuing costs of the infrastructure. To decrease these costs, to prevent each separate settlement from rushing too hastily to maturity and self-sufficiency, and to achieve important social and comfort goals (which we will discuss later), a compact, functionally-interrelated form is preferable. Unless strong arguments can be mounted (based perhaps on political grounds) against such a form, the arid-zone planner should adopt it.

This form will help create a livable environment; however, site selection per se will finally determine whether the new urban environment is habitable. To select an appropriate site, an interdisciplinary team should consider such factors as elevation, topography, geomorphology, wind direction and velocity, exposure to solar radiation, relative humidity, eolian movement and other soil characteristics, and the amount and nature of the precipitation.

Planners have not turned to the urban form recommended above in sufficient numbers: they have not learned the important lessons taught by the ancient civilizations that thrived in the arid-zone; they have, rather, noted the lack of substantial research and, then, fallen back on forms used in humid regions and introduced them into the

arid-zone where they must fail. Based on the crucial lessons taught by past civilizations, we can derive an urban model featuring the following:

1. individual structures grouped in compact clusters in order to maximize shadow, with cities consisting of many such cluster;
2. orientation so as to capture cool breezes, minimize glare, and reduce solar heat reflection;
3. water used (if available) to effect cooling and reduce the landscape's harshness;
4. the heavy use of open central courts in order to maximize both shade and ventilation;
5. a shaded, protected pedestrian network; and
6. the avoidance of large, unshaded open spaces by planning the proximity of different land uses.

#### Strategies for Economic Development

Even if we design an urban form which maximizes population density, the population density throughout the given arid region will still typically be low. As a result, the cost of infrastructure will still be higher in the arid-zone than in the non-arid-zone. The cost of transportation and transportation systems, one important part of the regional infrastructure, will affect commerce, making it costly and inefficient. Thus, the arid-zone city will have to plan for economic self-sufficiency, at least in so far as the goods and services needed on a daily or weekly basis are concerned. This goal can be attained by diversification, by clustering urban cells each of which is primarily engaged in a specific (or several specific) economic activities important to the entire region, and by designing ample storage and refrigeration facilities.

Although the new community should not rush carelessly toward self-sufficiency, it should plan--and be planned--to achieve this goal as quickly as possible. Doing this will necessarily increase the financial drain on the developer in the short-run; however, with self-sufficiency will come increased stability. And, considering the unstable population a new arid-zone urban settlement typically attracts in its initial stages, this is a real advantage. A diversified economy will, moreover, attract a desirable population mix to the community, further increasing its stability. The development of an arid region on a regional basis, as described briefly above, presents the greatest prospects for economic success.

Other factors will cause the initial investment costs to be higher than those in humid regions: building materials must be imported; skilled labor must be imported and paid well; and water may have to be imported until regional water supply networks are designed and built. These high costs will probably dictate that the initial investment be public, especially since the per capita incomes and Gross National Products of arid-zone nations are typically lower than those of non-arid-zone states.

Recognizing the typically weak economic state of most arid-zone nations, the planner must redirect the land use pattern in new settlements from agricultural domination to economic diversification with basic industries, manufacturing, tourism, and recreation all playing important roles. This redirection (in line with the current trends we noted in this paper's first section) makes development on a

regional basis even more necessary. To enhance the chances of success of the first two of these four components, the infrastructure--especially the transportation network--must, again, be given the highest priority. (Initially, air transportation must be relied upon.) To enhance the chances of the latter two components, high-quality hotels, motels, and restaurants will have to be planned for, and the area's attractions, such as the archeologically-interesting sites of ancient civilizations, will have to be worked into the regional plan. These last two components, we should note, are extremely important: they will provide new jobs for the indigenous population, and they will bring foreign currency into the region. However, tourism and recreation should not be depended upon exclusively: the economy of the arid-zone new community must be diversified.

### Social and Health Strategies

The climate of the arid zone is, of course, harsh. While the community is first being built, the residential conditions will not be ideal. Thus, the demographic structure of the new community will at first be dominated by young bachelors and young married couples, with and without children. Planners must take this into consideration and provide low-cost housing (some for rent) and the appropriate educational facilities.

Since comprehensive medical facilities will be lacking initially, regulations guarding environmental quality must be strictly enforced. Primary health services however, must, from the very beginning, be available and of a high quality since the new community will be isolated from older urban centers. This isolation and the demographic structure will necessitate that certain medical specialties be emphasized early. Among these would be psychiatry, gynecology, obstetrics, pediatrics, and dermatology. These specialized medical services will help attract pioneering souls to the otherwise unattractive early community. The attitude of the early settlers is very important in determining the community's chances for success. Just as important is the mix of skills--industrial, technological, and management-- that they bring to the arid-zone new community. Also it is desirable that the early residents represent a variety of social classes, giving the community, from the outset, a society in which residents with different economic backgrounds mix.

### Strategies for Agriculture

The low precipitation characteristic of the arid-zone and the low degree of water retainability (due to soil characteristics and high rates of evaporation) make planning for dry farming problematic at best. If water is available, irrigated agriculture using the new drip method may be possible. More likely, the arid-zone new community will have to rely on greenhouses. Despite the high initial costs, greenhouses, in so far as they do not contribute to the air's dust content and cannot be washed away by the occasional torrential rainfall characteristic of the arid zone, are advantageous. And, when properly designed, greenhouses are environmentally economical: they capture solar heat, reuse precious water, and reduce evaporation by increasing the humidity in their microclimates.

If agriculture is part of the arid-zone new community's economic mix, the crops should be carefully chosen. Those that require little water, easily adapt, are fast growing, are self-fertilizing, are salt tolerant (such as sugar beets), use solar energy efficiently, have a high market value, are characterized by a high yield, have few or no leaves, and require little space, are ideal. If agriculture is not part of the economic mix, then, on a national basis, the urbanization of



the arid-zone can be coupled in a strategy with the agricultural use of the non-arid land which is currently being devoured by urban growth.

### Research Strategies

From what we have said thus far, it is fairly obvious that research must now be directed to areas other than agriculture and the issues tied to it such as soil conditions and climate. Research, first of all, must be done on the impact of settlement on the fragile arid environment and the impact of the environment on the settlement. This is basic--and crucial.

A second, more specific research focus should be on suitable urban forms for the arid regions of the world. Site selection criteria, the proximity and pattern of land uses, cityscaping and landscaping using native vegetation requiring little water, and subterranean construction are all issues which need to be further discussed.

A third, even more specific focus should be on housing design. An ideal design would provide a comfortable living environment on both a daily and a seasonal basis, would require a minimum amount of energy, be simple, and require a small investment on the part of the owner making the dwelling available to the low and middle income groups.

The design of educational facilities should be a fourth research focus; and the design of recreational areas should be a fifth. Psychological and physiological concerns are very important in the former case, whereas water management issues are crucial in the latter since, in a hot, dry arid climate, recreation will tend to be oriented toward the cooling water.

At the core of almost all research efforts will be the arid zone's stressful climate. A sixth research focus should specifically be on how the residents are affected by their new environment. Socialization patterns, health problems, nutritional problems, and clothing requirements should all be studied quite carefully.

If new communities are to survive in the arid zones of the world, more research is definitely necessary in economic and financial matters. This is a seventh important research focus, and some of the questions economists should consider are what should the economic base of an arid-zone city be; how should development be encouraged; what should be invested in first, second, third, etc.; what should the respective roles of the private and public sectors be; and how should a diversified employment picture be created.

Research on agriculture should not stop: it is an important eighth focus. Issues such as how to maximize salt tolerance, maturation, drought resistance, and heat tolerance should be explored. And the bright prospect of greenhouse agriculture, which we discussed earlier, should be given the serious attention of the theoretician and urban planner. The former should consider ways of scheduling harvests so as to meet market demands; the latter should try to integrate greenhouses into the design of an arid-zone community.

A ninth focus should be on maximizing the water supply. As Table 2 reveals, seasonal and perennial rivers, clouds, saline water, ground water, and recycled water should be considered as sources; damming, diverting, seeding, desalinizing, pumping, treating, and conserving are the strategies available: not all can or should be turned to. However, to determine what strategies are suitable in an arid-zone city, all should be studied carefully.

TABLE 2 Water Resources Alternatives in Arid-Zone, Their Control Systems, Problems and Possible Solutions or Advantages.

Source	Control System	Problems	Possible Solutions or Advantages
Seasonal Rivers	*Dams and Reservoirs *Canals	*High Evaporation *Insecure	*Underground storage *Enriching ground water
Perennial Rivers	*Diversion of streams *Canals or pipelines	*Expensive *Dependency (Political or economic) which can bring conflict of interest	*Mixture with brackish water *Can be secured in drought time
Clouds	*Seeding	*Limited results *Not reliable	*Complementary source
Desalination	*Plant of large scale *Transportation of salty water	*Expensive and requires large initial investment - economically viable on a large scale only *Consumes energy and makes it dependable	*Can be economical for urban use (washing, drinking, industries)
Ground	*Pumping	*Limited *Low quality	*Mix it with good water
Recycling	*Sewage provides "perennial rivers" and is always available *Industries utilizing water can have self-recycling system	*Sanitary problems *Requires large initial investment	*Reliable alternative source *Can be used for recreation and swimming pools *Supports agriculture *Provides alternatives *Diminishes ecological problems
Saving	*Accepts only industries not consuming water *Decreases evaporation and evapotranspiration *Eliminates useless shrubs *Landscaping only with native plant which does not consume water *Uses chemical instead of flushing *Improves agriculture techniques in using greenhouses and dripping irrigation only *Comprehensive water sharing program and distribution by rules and regulations *Progressive prices	*Requires strict regulations *Requires persistent education for local population and visitors	*Eases critical situation *Can become complementary and part of a comprehensive plan, but cannot be the only alternative

A tenth, and final, focus should be on the use of solar energy, both on the small scale of the individual home and on the large scale of, for example, factory, apartment building, or hospital. The research in the former has been promising. We need to push forward, since the sun is the only known inexhaustible source of energy and the arid-zone is rich in it.

The research, quite obviously, must span a wide variety of disciplines. To facilitate this and to provide the world's arid regions with planning experts, an international educational center is essential. Such a center would be staffed with experts from the disciplines of engineering, architecture, planning, economics, physiology, agriculture, geology, government, sociology, etc. These experts would be members of the academic community as well as people who have had practical experience and expertise in their fields. The students would be drawn from a wide variety of backgrounds: their baccalaureate degrees would be in many different fields. The educational and research center would allow them to receive a post-graduate training preparatory to actual work in arid-zone development.

### CONCLUSION

These strategies are not definitive statements: as we noted earlier, they have to be adjusted to the specific region and to the particular culture. Nevertheless, as the recommendations which concluded our discussion of trends in policy pointed to the strategies outlined above, these strategies do indicate a number of directions which urban planners would be wise to make when working in the arid zone. First, they point to the need for a comprehensive, carefully planned program on national, regional, and local levels. Second, they point to the need for rapid and carefully regulated early construction, especially of the infrastructure. Third, they point to the importance of self-sufficiency and--to prevent the negative effects of each small community's rushing too rapidly toward that goal--the advantages of clustering the urban cells within a region together. Finally, they point to the need for ongoing, intensive research and experimentation.

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# Regions as Growth Poles: The Negev as a Case Study

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## INTRODUCTION

The high rate of industrialization and urban growth has effected an unbalanced development of different regions within one and the same country. In this way a gap has been created between a small area of concentrated economic activity around the large urban regions, and the bulk of the country which remains in agricultural use or lies as entirely vacant unused land.

Such a situation is an international phenomenon leading to a wanting quality of life in densely populated regions by turning good agricultural land to urban use in regions of socio-economic concentration and, at the same time, increasing the migration from less populated areas into such regions.

One of the main objectives of national planning in different countries has been to achieve a more balanced development, but reality shows that there is a gap between the planning goals and the achieved results. An insufficient allocation of resources and an inappropriate approach to developing the less populated regions appear to have created such a gap.

The attraction of large urban centers is mainly due to the variety of employment sources and to a high level of services. The lowered quality of life in city centers has not stopped migration to the urban regions, or hampered the formation of new neighborhoods and settlements on the outskirts of the city, thus enlarging the radius of the urban region. Obviously, there is no necessity to stress the need for a balanced development or to explain the shortcomings of present reality.

There is however, an urgent need to change the present trend of development, through using such methods as may achieve the desired balanced development. Our assumption is that one of the ways to achieve a more balanced development is not to disperse the national resources in establishing some industries and housing projects in scantily populated areas, but rather to concentrate all the means on creating a socio-economic center parallel to those existing at present. The aim should be therefore to direct the national resources towards creating a new, highly developed region in a less populated or in entirely vacant area.

The task to be undertaken is to create a new region and not a new town by itself. Modern industry needs a great deal of auxiliary services, since highly qualified manpower requires not only good housing, but also an environment with high quality cultural, educational and other services.

A new planned industrial region should possess sufficient size to justify the establishment of regional services for modern industry, as well as the provision of a full gamut of services and recreation areas within its framework, in order to present a high level of environmental amenities.

Obviously, one of the difficulties in creating such a regional growth pole is the permanent conflict between the long-term planned objectives and the short-term socio-economic pressures. Probably the knowledge of this conflict may allow us to establish flexible long-term planning strategies by adapting the designated objectives to the continuously changing factors, that influence the implementation of the planned scheme.

#### ISRAEL DEVELOPMENT GOALS

In Israel there exists a marked contrast between the successful land-use planning for agricultural production and rural settlements and the haphazard planning and quality of life in the overcrowded cities and towns. The concentration of most economic activity and population on 11% of the land - the coastal strip - and, at the same time, the exhaustive use of available water resources, create an apprehensive notion of lack of space and fear for the future. The presently accepted development scheme for a population of five million by 1990-92, based mostly on current urban settlement patterns, makes the apprehension even stronger.

On the other hand, ever since the State's establishment in 1948, population dispersal is considered an avowed goal of adequate planning. The present settlement patterns and the plan for 1990-92 are a result of the permanent conflict between planning goals for balanced development and socio-economic factors favoring concentration around existing urban centers. Thus the location of employment possibilities and the high level of services in the center have favored continued concentration, despite stated planning goals.

Population growth in outlying areas has been stimulated by enormous investment in housing projects and the subsidization of some industrial enterprises in thirty new towns. These efforts have succeeded to some extent, especially, in increasing the population in the south (Ashkelon and Beersheba regions), but have not fostered a major shift in the concentration of people and economic activity away from the center.

The following table shows the changes in population distribution, by region, from 1948 to 1975 (percentages of total population), and the planned figures for 1992:

TABLE 1 Population Distribution 1948-1992

<u>Regions</u>	<u>1948</u>	<u>1954</u>	<u>1961</u>	<u>1968</u>	<u>1975</u>	<u>1992</u>
North	16.8	16.6	15.5	15.3	15.2	16.0
Center (inc. Haifa, Tel Aviv)	70.5	69.5	67.7	63.2	61.6	57.1
Jerusalem	10.2	9.2	8.8	10.7	11.2	12.8
Ashkelon sub-district	0.8	2.2	3.5	4.7	5.0	5.4
Beersheba sub-district	1.7	2.7	4.5	6.1	6.8	7.4

The table indicates a slight drop in the role of the north and center, and a relatively significant rise in the role of the south, which still remains by far the least densely populated. The table also shows that the quickest change in the planned direction occurred between 1953-1968 and slowed down later.

One drawback of Israel's contemporary planning is that it has been primarily based on immediate needs, ignoring its repercussions on future programs. The result can

be seen in the considerable economic and social development in the crowded coastal regions, where the level of services is high and the concentration of economic activity constitutes a natural focus of settling attraction to the same region. True, thanks to investment by government institutions in the industrial development of outlying areas, the weight of manufacturing in these areas has increased, but not to a great extent. This has taken place without the concurrent development of services that could provide an incentive for the concentration of economic development in a given region, could open up a variety of employment possibilities, and lead to a greater concentration of settlers in underpopulated areas.

The setting up of many new settlements in the form of development towns has not brought nearer the development of underpopulated regions, because of the lack of an adequate center of vigorous economic activity that could constitute an alternative to the existing concentration in the coastal strip.

Utilizing an unsettled area in the south of the country for creating a region of economic and population concentration that would compete with the coastal plan, seems at first sight an impossible proposition. In the past, priority was given to agricultural development, and concentration of economic resources and manpower in this sphere has produced internationally-recognized achievements. If priority will now be given to urban-industrial development, the same human material that has achieved such spectacular results in agriculture and in military skills should presumably be able to achieve similar success in creating a major urban-industrial concentration in the unsettled expanse of the Negev.

An examination of the potential land resources and uses, compared to those of various other parts of the country, analysis of the climate and the possibilities of water supply and its conveyance to the unsettled region, can help to formulate a conception for development of this region today, and to determine the lines of the necessary planning activity. Tables 2 and 3 show the present land-uses in the country.

A look at the data in the tables shows that out of a total 20,000 square kilometers, about 7,000 are in use or allocated for various purposes; about 1,000 are unusable; and, at the same time, about 12,000 square kilometers constitute a still unused land reserve. The data in Table 2 show that in the Jerusalem, North and Central regions, 2,500 out of 6,000 sq. km. are under agricultural use; and the remaining 3,500 include the unusable 1,000 sq.km. and the 2,500 sq. km. are intended for use as forests, nature reserves, etc. Out of 14,000 sq. km. in the Ashkelon and Beersheba districts, 12,000 make up a land reserve, after deduction of 1,800 sq. km. that are in agricultural use. This includes about 1,000 sq. km. intended for agricultural development northwest of Beersheba, and about 200 sq. km. in urban use or allocated for other purposes. Thus, there remains a reserve of about 10,000 sq. km. - mainly south of Beersheba - available for future urban and industrial development. Study of the climate and of the topographical structure of the region shows that 7,000 sq. km. situated south of Mizpe Ramon is not suitable for urban settlement, and might serve as national parks and nature reserves, while 3,000 sq. km. - mostly south of Beersheba and partly north of it - can serve as an area framework for future development goals. A check of climatic conditions and of water resources needed for the population and for industrial development in this area will permit drawing conclusions as to the chances of exploiting this area in the future for the creation of an urban-industrial development complex.

In order to provide a clearer indication of the nature and extent of land requirements for such a complex, the following details and statistics are offered as guidelines. For the most part, these details are based on a United Nations study on Urban Land Policies, especially the sections dealing with land needs (U.N. Department of Economic and Social Affairs, Vol. III, No. E73, W2 pp. 48-73, N.Y.,

TABLE 2 Land Area in Israel

Total:	20,770 sq. kilometers	
Lakes, etc:	445	
Land:	20,325 sq. kilometers or:	20,325,000 dunams
Unusable (rocky, unarable)		1,000,000
Cultivated		4,300,000
Built-up area	800,000	
Additional area zoned urban	400,000	1,200,000
Forests: natural:	350,000	
planted:	600,000	
reserve:	250,000	1,200,000
Nature reserves:	280,000	
in planning :	60,000	340,000
Fishponds		50,000
Historical sites		30,000
Quarries, natural resources, military areas:		220,000
Total land in use:		8,340,000 dunams
Land reserves:		11,985,000 dunams

TABLE 3 Agricultural use and population, by regions (1975)

Region	Area (km <sup>2</sup> )	In Agricultural Use (km <sup>2</sup> )	Population	Average density per km <sup>2</sup>
Jerusalem	267	100	392,100	625
North	3325	1300	531,900	160
Haifa, Tel Aviv, center	2266	1100	2,149,700	950
Ashkelon district	1272	600	176,200	139
Total	7490	3100	3,249,900	434 (mean)
Beersheba district	12,835	1200	237,500	18 "
Total	20,325	4300	3,487,400	172 (mean)



1973). The study was prepared by the present writer. Additional details, particularly applicable to developing countries, are included in his forthcoming book Land Policy and Urban Growth.

The published figures on land requirements for particular land uses differ for different cities, not only because of the city size, but also because of the varying classifications and definitions of land uses in different countries. A small town in a large metropolitan area may need less land because it does not provide all urban functions; thus, its allocation for employment and services may be lower than that of the region as a whole. According to calculations for planned settlements, land requirements for European countries may be estimated as follows:

TABLE 4 Land Requirement range and average for different uses in European cities (square meters per person)

Use	Range	Average
Residential	67-144	110
Roads	30- 50	40
Green Space	40- 56	48
Public Services	20- 40	30
Industry	18- 44	30
Commercial Services	10- 23	12
TOTAL	185-357	270

#### Five-Six Million in the Negev

Using a norm of 270 m<sup>2</sup> per person, and allowing the same area to insure that the necessary land will be available for meeting national and regional needs such as roads, recreation areas, power stations, exploitation of natural resources, etc., one can conclude that 540 m<sup>2</sup> per person can provide a high quality of life in the Negev development area. Thus, a population of five to six million can be settled on 3000 square kilometers, and with a higher quality of life lived than in existing Israeli urban settlements.

The United Nation study demonstrates that a decisive factor for providing an adequate quality of life in urban areas is the planned use of land resources as carried out in new cities in various countries, and as opposed to unplanned use of land in existing cities.

Thus, the central problem connected with the possible use of land resources in the Negev is that of adopting an appropriate strategy for overall regional planning, based on long-range land use, with the goal of creating conditions that would attract a new population to the area.

A wide choice of employment and well developed services are the reason that Israel's population growth has been concentrated in the urban regions of the coastal plain. This is so despite air pollution, overcrowding, high cost of housing and land - in opposition to the government's policy of directing the population to new towns in development areas.

The concentration of economic, social and cultural activity in large cities is the decisive factor in the population's desire to live in the urban regions. Formulation of a strategy for creating conditions to enable the new planned Negev area to

become a center for attraction is a precondition for transforming its potential into reality.

An analysis of the climate and the possibilities of supplying water and conveying it to the new region can help to formulate a conception for its development and to decide on the needed planning activity for carrying out the plan in the future.

### Climate

An examination of climatic conditions in the Negev region, and especially in the part chosen for the urban-industrial settlement, shows them to be much more pleasant than in the coastal area in which the majority of Israel's population is concentrated. Prof. Ezra Zohar states this in his study published in "Mada", 17:1, April-May, 1972. The study is based on a comparison of maximum, minimum and average temperatures in various parts of the country for certain months and hours of the day. A discomfort factor ranging from 22C. to over 28C. was also set, representing the level of comfort or discomfort to humans.

In general, the Negev is composed of two areas, differing primarily by altitude, which also influences temperature. One area lies at over 600 m. of altitude, as represented by Arad, and the other lies below 600 m. as represented by Beersheba and defined as desert lowland. In general, the area is pleasant and air conditioning is unnecessary. Beersheba's summer discomfort factor is 26.8, higher than average, because of special conditions obtaining in the city.

Arad typifies the area south of Beersheba as far as Mitzpe Ramon, an area of desert heights composed of chalk and dolomite. Topographically, there are certain differences between different sections of the region. The climate is pleasant. The discomfort factor is 26.2, while that of Tel Aviv is 27.9 (figures for August).

A comparison of the number of hours of discomfort in various parts of the country from May to October, and especially in August, demonstrates the climatic advantages of the Negev mountains in another way:

TABLE 5 Hours of Discomfort in various cities

City	May-October	August
Tel Aviv	73.5	13
Beersheba	51.5	14
Dimona	34.0	10.5
Arad	30.5	10
Upper Nazareth	29.5	10
Afula	78.5	22
Naharia	28.0	24

With this comparison, the climatic advantages of Negev cities stand out, compared to the coastal area. In this respect they approach the pleasant climate of upper Nazareth.

Thus, it must be taken into account that in the Negev mountain region, the wind is an important factor affecting human comfort, as in other desert regions. City planners and architects believe that it is possible to minimize the effects of wind by appropriate construction and city planning methods.

### Water

Israel's water use already approaches the limit of its existing water sources, replenished by precipitation in the rainy season. The following data show the amounts of water used in 1975: Home consumption of water - 327 million m<sup>3</sup>; industry - 63 million; agriculture - 1200 million. This also includes use of recycled sewage to the extent of 303 million m<sup>3</sup> in that year.

Thus, the total annual use of water is 1590 million m<sup>3</sup>. The agricultural sector uses water to irrigate 1,800,000 dunams, which constitute 40% of the cultivated area, while the water for home use is consumed by 3.5 million persons (in fact, the figure for drinking water also includes the amount consumed by industry and workshops within the urban areas. The quantity of 63 million m<sup>3</sup> for industry relates only to the large factories which consume more than 5000 m<sup>3</sup> each.

The total annual per capita consumption of water for home and industry (including the large factories) is 110 m<sup>3</sup>. Cost is one of the central problems in exploitation of recycled and desalted water, the use of which will determine the possibility of water supply for large populations of the future.

Indeed, environmental problems crop up also in connection with establishment of plants for sea water desalination based on nuclear energy. The movement which has arisen in the world against nuclear power plants represents the natural opposition to technological innovations which, under certain conditions, are liable to cause harm, but do not necessarily arouse problems if properly designed.

The cost of desalted water is also connected with the population's income level, the industrial output value and the relative weight of water desalination cost in industrial costing. We can get an idea of the weight of desalination cost in economic development by a hypothetical calculation on the assumption that all of Israel's present 3.5 million population were to use desalted water for home and industrial needs. The average consumption of drinking and industrial water is, as stated, 110 m<sup>3</sup> per person annually, at a price of IL.440 a year, or IL.1540 million for a population of 3.5 million. The per capita national income in 1975 was IL.12,960; thus the cost of such water would be no more than 2.6% of the national income. It should be noted that our calculation uses the 1976 water price and the 1975 income figures; thus the real percentage is even less, since the 1976 income was higher than that of 1975. An examination of the composition of the various categories of private consumption will show clearly the value of the 2.6% figure for water expense. The total value of private consumption in 1975 was IL.45,372 million, including expenditure for entertainment amounting to IL.2909 million, or 3% of the total private consumption. The total price for drinking and industrial water, then, is no more than one half of the entertainment expenditure (IL.1540 million for water).

The above calculation shows that the cost of desalted water is not an obstacle to future industrial development in Israel as a whole, nor particularly in the Negev region. There is also ground for the assumption that with technological development, the relative water cost will decrease as a portion of production costs and national income.

Having indicated the existence of suitable land, a comfortable climate and a reasonable cost of water for settling an industrial urban population in the Negev, we must respond as well to the questions connected with the approach required for settling a varied population in a multi-dimensional region.

### New Lifestyles

The chances of carrying out the proposed plan for settling the Negev are tied to considerations of the region's special conditions - an arid zone, though with a comfortable climate, located at a certain distance from the country's center of economic activity. These conditions demand on the one hand, a concentration of resources for execution of rapid and extensive economic development and, on the other hand, determination of urban settlement models which would enable various types of population to settle there, in line with their special needs and aspirations.

The fact that the now vacant area opens up possibilities for certain groups interested in developing lifestyles different from those accepted in existing settlements, can perhaps become an attractive factor for them. Of course, development of a settlement conception in a region meant for millions demands great investment of thought, and a cost-benefit economic analysis, etc. One condition for the idea to become a reality is a long-range view of the planning process as a decisive factor in carrying out short-term plans. Looking into the possibility of establishing large industrial centers with an overall framework of all the necessary services for modern industry, the provision of urban settlements for different population sectors is one possible approach. In addition, the possibility should not be dismissed of expanding existing cities to dimensions not considered in the past, where topographical and climatic conditions can permit the creation of settlements with greater power of attraction.

### A Regional Conception of Planning

Considerations of long-term land use planning should aim not only at establishing an additional development region, but at creating a regional growth pole which would serve as a basis for future concentration of socio-economic activity. The achievement of such an objective is connected with considerable investment in physical and social infrastructure needed to offer favorable conditions for gainful employment and high-level services.

Nevertheless, a cost-benefit analysis may show that it is more efficient to invest resources in advanced, well-planned infrastructural works and high-level services, which may attract the needed qualified manpower for industries, rather than to base the human settlement mostly on housing projects, and providing the services only after a period of time.

The problem of size for an urban-industrial center or even a regional complex is the decisive factor for the erection of high-level services and a variety of employment openings.

The existing potential of the unsettled Negev region offers the opportunity to create the needed conditions for a well-planned urban-industrial complex for an additional 5-6 million inhabitants in the future.

Although the required financial means may be a serious obstacle for transforming the scheme into reality, nevertheless the lack of space and the very high land costs in the urban coastal area, together with the application of some economic incentives in the newly-planned regions, as well as the allocation of needed space for new industries and new human settlements, may facilitate the implementation of these development goals.

An additional factor which will probably influence the need to deflect Israel's

further development from the coastal area to the Negev is the necessity to maintain the agricultural land still remaining in the coastal area for crucial agricultural production only.

The settling of a new large-sized urban-industrial region may prove to be of importance not only to Israel, but may also serve as an example to other countries, where a large part of the population is concentrated in a small urban area, while large sections of the country still remain unsettled.

Thus, it may be suggested that Israel's past experience in agricultural and rural planning might be helpful if the long-term development goal of creating an urban-industrial complex in the Negev will be given the highest priority.

# Planning Settlements for Upland Arid Regions: An Overview of Environmental and Building Considerations

Matti Cones

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## WHY THE NEED FOR DESERT SETTLEMENTS?

Desert settlements were established and existed for thousands of years but on a small scale. Today, due to the extension of human activity into the desert on a larger scale, many more settlements need to be established.

One can cite three main factors strongly influencing this trend:

1. Attraction to the area aroused by important natural resources (e.g. oil, metal or chemical ores, etc.) as in the Arab countries or Australia.
2. Because of the world food shortage, for example in Asian countries, there is need to exploit more potentially arable lands located in arid regions (e.g. loess soil), particularly after the discovery of underground water resources present in most deserts, or following the construction of large hydraulic works (e.g. water carriers or dams).
3. Planned population dispersal, in countries where arid regions constitute a large part of the territory, while the population is concentrated in the few non-arid (and usually agriculturally fertile) areas. In the case of Israel the Negev covers 60% of the country's area and only holds 6.8% of the population. In contrast, 70% of the population of Israel lives on 20% of the land within the "Green Lines" (Statistical Abstract of Israel, 1977).

## WHAT ARE THE CHARACTERISTICS OF UPLAND ARID REGIONS?

Generally arid regions arouse in human beings the feeling of a "hostile environment" characterized by:

- High temperature variations between seasons (summer-winter) and in the course of the day (morning-night), where the amplitude of change varies, according to location (distance from the sea, altitude, etc.).  
e.g. - 40°C summer day - 20°C summer night  
40°C summer day - 10°C winter day
- very low relative humidity (ranging from below 20% in the afternoon to over 40% at night).
- almost constant winds, dust and sandstorms.
- very small quantity of precious seasonal rainfall (25-200mm), and

flash-storms which cause flooding in wide areas, land erosion and sometimes destruction of man-made structures.

- the feeling of "isolation", due to monotony, the bleak landscape and the lack of facilities and greenery.
- the sun's physical impacts on buildings, vegetation, animals and human beings (high insolation, glare, etc.), and other factors such as dust (causing eye irritation, grime, etc.) and wind.

#### HOW TO PLAN DESERT SETTLEMENTS

There are two important stages in planning the development of a specific site which will define the final character of the settlement: site selection and analysis, and site organization and construction.

The following considerations will be grouped with reference to each of the above stages.

##### Site Selection and Analysis

Having defined the wider region where one or more new settlements would be located, we can then pinpoint the most suitable sites, using one of the existing overlay or computer methods and by considering the following environmental factors:

- proximity to existing surface water (pool, river, lake or sea).
- distance from floodplains. (Preference will be given to higher locations, resulting also in better ventilation of the site)
- proximity to as rich fresh water resources as possible.
- existence of soil most suitable for the construction of buildings (e.g. hamra sands - deep strata) and for agricultural use (arable fertile land, e.g. clay or loess). Here one should stress the need for special precautions when intending to build on agricultural soil (usually unsuitable for construction) as in classical "Moshavim" (co-operative villages) where the houses are located on the farming plot. Use of piled foundations and floors raised above the ground are typical solutions.
- lack of excessive stoniness of the ground. (Preferable are areas where stones hindering cultivation or construction can be easily cleared.)
- Slopes and orientation. For non-agricultural uses (e.g. housing, etc.) slopes (10-20%), facing east, south-east and south are preferable because they receive less solar radiation in the summer. Lower parts of slopes, where cool air flow can be utilized are most attractive.

For agriculture, land facing the prevailing winds, after passing over the built-up area of the settlement, seems best. By such a choice we may achieve the following effects:

- more rainfall on the cultivated land. In the Negev, where west winds prevail, west-facing slopes receive more rain (Sharon, 1977).

However, for cultivation, a northern orientation is preferable to a southern one because of less evaporation.

- "Heat island phenomenon" (the temperature in an urban area is usually higher than in the surrounding country) utilization. Although its significance has not yet been established completely, a hypothesis suggests that by locating the fields to the windward side beyond the settlement, this phenomenon may offer protection against possible local frost incidence through the effect of wind-carried heat over the fields (Givoni, 1972) (Berkofsky, 1976, personal communication).
- Existence of or proximity to vegetation is not only preferable but highly desirable in the desert (e.g. oases).
- Locations offering views to interesting landscape features (e.g. heights facing "sculptured" desert plains, as in the wilderness of Zin).

#### Site Organization and Construction

After having selected the site, one should proceed to the second group of considerations pertaining to land modification and building construction.

Here one must stress the need for these considerations to be treated comprehensively. By this is meant that it is very important to take into account, as much as possible, all the considerations simultaneously during the investigation of any one particular feature (e.g. an undesirable orientation of a patio, forced by circumstances, could be compensated by proper vegetation planting).

For methodological reasons, these considerations can be grouped as follows:

- general layout - "fabric" of the settlement
- Building design and details.

Starting from the larger scale considerations, the planners' objectives should be:

- Creation of high density (e.g. more than 12 dwelling units per dunam); close-knit urban structure (compact design) with inward-looking elements (e.g. patios) resulting in a shaded layout and "defensible" spaces (O. Newman, 1976).
- Elimination of long walking distances between the settlement's different amenities, resulting in less effort and heat loss or gain by the pedestrians or cyclists.
- Creation of "windbreak" walls (built or green) around the settlement and/or along the edges between the different land uses and amenities, resulting in wind and dust control (e.g. wind filtration, reduction of velocity), and in overcoming the feeling of being surrounded by a "hostile" environment (G. Robinette, 1971; Saini, 1974).
- Increase of cooling effect and humidity to reach acceptable comfort standards in very hot, arid areas (e.g. by creating an artificial lake, situated so as to receive existing summer breezes before they reach the settlements).



- Avoidance of high-rise buildings, whose presence creates strong turbulent wind currents at ground level and results in an increase of wind velocity and the raising of dust clouds (Givoni and Patciuk, 1971). In general, preference should be given to smooth rather than rough urban texture.

- Desert settlements usually lie away from central infra-structural networks (energy and water supply, sewerage and waste disposal) and the cost of connection to them is usually high. Besides, unexpected damage or malfunctioning of the network may result in stoppages in the supply, with dangerous side effects (e.g. death of livestock or drying up of plantations). Therefore, towards partial or total autonomy, the following aims are strongly emphasized:

- \* Reduction of consumption by means of conservation and recycling
- \* Utilization of natural energies (solar, wind, etc.)
- \* Provision of energy and water storage facilities

Also, going even further, reduction of consumption means saving natural resources (e.g. oil, water) and less environmental damage (e.g. air or water pollution) thus contributing to the preservation of nature's ecological processes.

Finally, the planners should bear in mind that for enhancing the feeling of interdependence among the members of the community and for counteracting the feeling of isolation, efforts should be made to bring the inhabitants into close contact with each other in most of their urban activities. This can be helped by narrow walkways instead of broad streets, car parking on the periphery and small enclosed open spaces that may increase frequency of desirable social intercourse.

Turning now to the specifics of building design and details, one should aim at the following characteristics:

- Increase the shaded surface of buildings and open spaces during the summer, but increase the heating effect of the winter sun during the cold period, either by its heating external surfaces of buildings or its penetration into them through large south facing openings. Suggestions for achieving these purposes are:

- \* Placing the long axis of buildings and small, narrow pedestrian ways (protecting the west frontages by planting deciduous vegetation) in an east-to-west direction.
- \* Access and main roads should be run from northwest to southeast.
- \* Overhanging shading devices for the various openings (windows, doors) in addition to outside shutters, for better sun control.
- \* A double or "parasol" roof (i.e. covering, umbrella-like the whole roof and letting air flow in between (Saini, 1973) also contributes to this aim, but provision for insulation of the lower part against the winter cold should be stressed.
- \* Optimum shading achieved by calculating the sun's position (altitude), so that the summer sun heats as little as possible and the winter sun as much as possible (especially in upland hot arid regions).

Another way of having less external wall exposed to the sun, which is actually used in vernacular desert architecture (e.g. Matmata in Tunisia - see Rudofsky, 1964) is placing the buildings underground (fully or partially). In this way temperature fluctuations are further stabilized (Golani, 1976).

- Using forms, materials and colours which contribute to preferable heat transfer patterns for better thermal comfort conditions (for more specific information see Givoni, 1969 and Hoffman, 1976). If preference is given to natural heating and cooling and a high heat capacity, enclosed walls with a dark exterior colour are used for spaces in continuous use, while light, white walls are used for spaces in periodic use. On the other hand, if artificial heating and cooling is preferred, then exterior walls with thermal insulation, and interior walls with a high heat capacity, can be used.

- Provision for cross ventilation of the buildings interior (at night in summer).

- Provision of tight sealing of all openings to prevent the penetration of dust (draught strips essential).

- Provision of netting in every opening to keep out insects and reptiles. Additional protection could be provided by creating a projecting zone around the building, whenever possible at the level of the elevated ground floor (method used in Africa against termite penetration - see Oakley, 1961).

Provision of interior courtyards (patios) which can be utilized in many ways, either for environmental (e.g. cooling pool) or human functions that are attracted by the open air but needing privacy (e.g. summer night sleeping).

#### SUMMARY

In conclusion we should remember the important general objectives in the planning of desert settlements can be summarized as follows:

- save energy and water
- make optimal use of the sun for cooling summer and warming in winter)
- make use of natural elements (climatic and/or landscape)
- promote social interaction
- plan and design comprehensively

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# **A Case for Local Architecture in an Arid Zone: The Negev Desert in Israel**

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Though small in area, Israel possesses a great variety of climatic and geographic conditions, not to speak of its cultural and human diversification. Nevertheless, the architectural and environmental appearance of the country's settlements is similar, throughout in complete disregard of local differences or special opportunities. In the course of Israel's building history, housing types have changed in size, standard and appearance, but the changes have been consistently similar in different parts of the country. Except for a few remarkable examples, national standards have proved stronger than local considerations.

The Negev's macro and micro-environmental characteristics, the physical planning of its settlement patterns call for greater sophistication and sensitivity in responding to local conditions. The development of a suitable life-style and the search for desert building concepts are two of the crucial issues to be solved in the planning and designing for this region. Just to mention one difference, if two to four times the quantity of water is needed to cultivate a unit area of grass in the south than is needed in the north, surely this necessitates modified planning norms for open green areas, as well as a more intensive use of those areas which do exist and which require so much effort to develop and maintain.

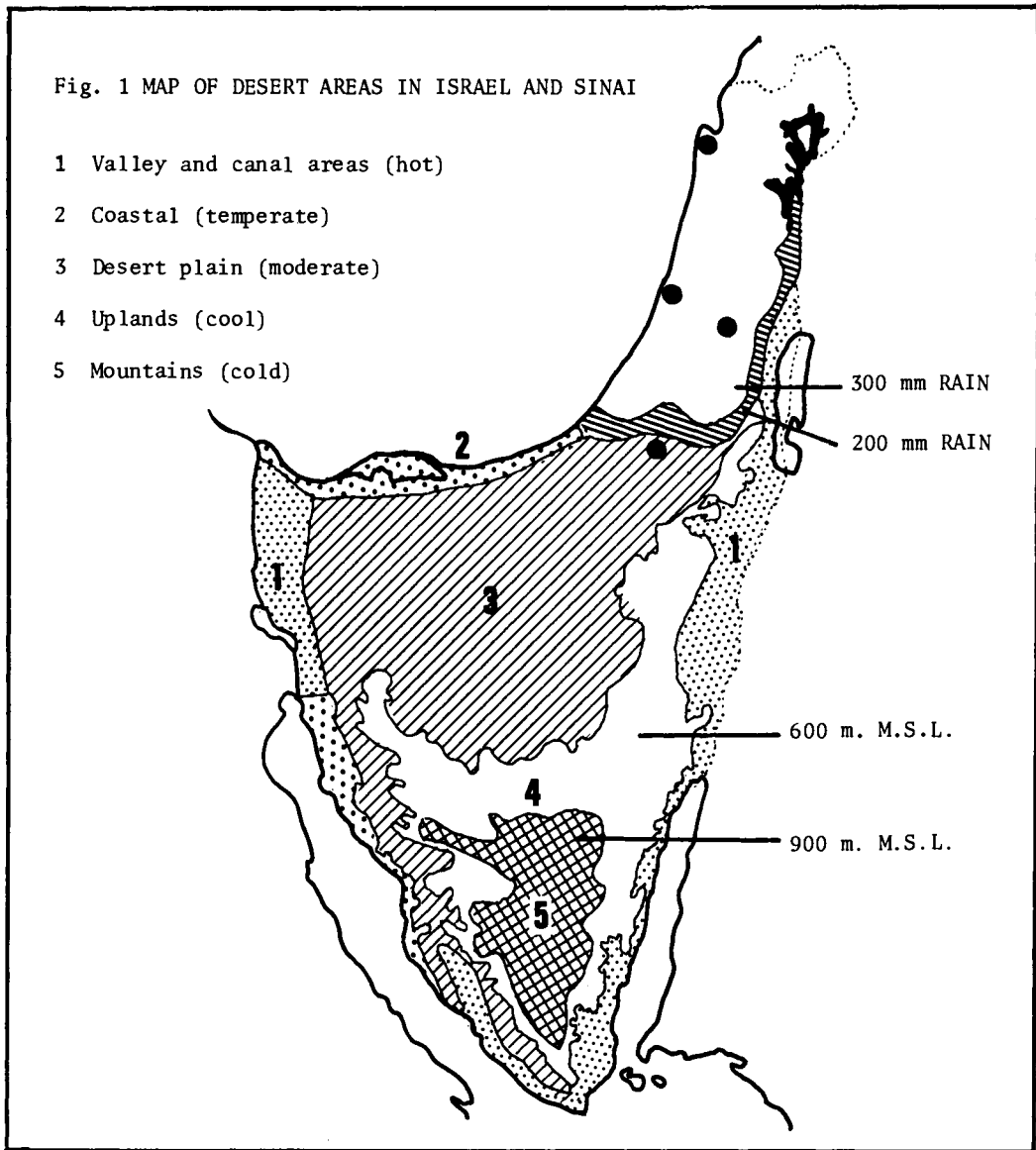
## CLIMATIC DEFINITION OF A DESERT

(See Fig. 1)<sup>1</sup> The primary characteristic of a desert is the small amount of its annual rainfall. It does not automatically follow that a desert zone is a hot zone. The Negev is characterised by larger diurnal and seasonal temperature fluctuations, and by steeper temperature gradients than the northern part of Israel. This can be explained by two factors: the distance from the sea, and the increased insolation (solar radiation) due to the lack of cloud cover.

## THE DESERT RESEARCH INSTITUTE (DRI)

The Government of Israel has established at Sede Boqer, in the Negev, an institute for Desert Research, to serve as headquarters and a focus for the main national and scientific efforts in arid zone research and development in Israel, as well as abroad. The DRI deals with a number of interdisciplinary projects: hydrogeology, desert ecosystems, economical botany, meteorology, building climatology, natural energies utilization, desert architecture, etc. Collaboration between the projects is encouraged, as in the case of the desert architecture and building climatology and use of natural energies projects headed by Prof. B. Givoni.

The Desert Architecture Project is involved in developing new responsive concepts of architecture and of urban and regional planning for desert environments. This



Temp. in °C	August		January		Discomfort Factor (Summer)
	max. daily temp.	min. daily temp.	max. daily temp.	min. daily temp.	
Jericho	1 38.5	24	20.1	9.8	31.4 v. hot
El Arish	2 30.6	20.9	18.5	7.3	28.5 v. hot
Tel Aviv	2 31	21.8	18.1	8.4	27.9 hot
Rifidim	3 33.5	19	17	6	26.8 hot
Arad	4 32.6	18.4	14	6.8	26.2 hot
Santa-Katarina	5 23	12	5	-3	17.4 no heat load

relates not only to new construction and planning but also to existing built environments in the Negev, whether cities, towns, moshavim, kibbutzim or other small permanent or temporary settlements.

#### RESEARCH, AN IMPLEMENTATION-DIRECTED ACTIVITY

To quote Prof. Amos E. Richmond, head of the DRI: "Israel already has a unique role in the study of arid zones and their settlement, because it is one of the very few countries in which two conditions prevail: on the one hand, the development of the desert is of vital national interest; and, on the other, there exists a good research potential stemming from a gifted scientific community."<sup>2</sup> The Institute's workers believe that their research has to be implementation orientated; and they are developing and welcoming dialogue and co-operation with designers and organizations involved in the formation of the built environment in the desert.

The building situation in the Negev at the end of 1976 was as follows; there were 113 settlements in the natural regions 32 to 36 (statistical division) considered as desert or bordering on desert. However, below the latitude of Beersheba there were 37 such settlements, which included four towns. The area south of Beersheba consists of 50% of the land area of Israel, but contains only 3% of the population. The planning in that area has shown varying degrees of environmental adaptation.

#### SOCIAL ASPECTS OF CLIMATIC PLANNING OF OPEN SPACES

In extreme climatic conditions the careful manipulation and design of open spaces is crucial. With little difficulty in obtaining land, there is an approach which proposes low density development. However, the resulting increase in distances, the investment in infrastructure, the demand for precious resources to maintain large areas, and the difficulty of creating climatically controlled open spaces makes this impracticable. The need for protection from the environment and the need to create a sense of place in presently isolated settlements, requires the creation of close-knit urban structures, and the treatment of the void between them as positive space. The resultant development and intensive use of spaces makes the preservation of privacy in individual dwellings all the more important.

#### INTERRELATION BETWEEN INDIVIDUAL BUILDINGS AND THE URBAN STRUCTURE

The urban community and connecting spaces are a result of the combination and organization of individual buildings. The goal of a structure is twofold: firstly it should satisfy the functions within itself, and secondly it should contribute to the formation of the "total environment". Since the desert can be considered an "extreme environment", with strong insolation, large temperature fluctuations, sandstorms, glare and little natural vegetation, it is not only the climatic adaptation of individual buildings that is necessary, but advantage should also be taken of the interrelation of individual buildings and their mutual effects on each other, as well as of the spaces between them, e.g. the shading patterns of a cluster of buildings.

#### SOME MICRO-CONSIDERATIONS

Solar energy systems are an integral part of architecture in general, but are especially attractive in arid zones, where there is an abundance of solar insolation and where the conservation of energy is a primary concern. Solar systems can be divided into two categories; passive and active. The active systems, in general,

require more mechanical investment, maintenance and control.

Many climatic factors are dealt with at the level of building components, and there are definite interrelations between these components and building types. For example, the climatic stresses on the introverted surfaces of a courtyard are less than those acting on the external surfaces of an extraverted dwelling, and thus the courtyard requires building components which need only contend with moderate climatic stresses.

#### CONCLUSION

A possible result of the successful formation of a settlement based on local and regional considerations might be as follows:

1. A closer identification of the inhabitant with his immediate environment, thus creating a stronger feeling of community and a definite sense of place.
2. A balanced relationship between the built environment and its surroundings, which could result in a more economic way of life for the settlement as well as a better ecological adaptation to its natural environment.
3. Once an example of a local form of settlement has been achieved in the extreme conditions of the desert, it would facilitate greater sensitivity when dealing with other regions of the country.

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## Introductory Note

In his paper on "Geographic Re-Evaluation of Town Distribution in Israel", Prof. Elisha Efrat states that study of the location of towns in Israel shows a marked lack of uniformity in their distribution: clusters of towns around certain poles and lack of towns in peripheral regions. Another shortcoming is that some new towns have been located in areas where their *raison d'etre* seems to be doubtful.

In its historical development, urban settlement took place in the previous two centuries when the Jewish minority settled in a few of the old towns, mainly the holy towns according to Jewish tradition. In the past 100 years these settlements gradually expanded and were supplemented by agricultural settlements, mainly in the coastal strip. Since the establishment of the State in 1948, a rapid building of new towns began, prompted by mass immigration.

The present situation shows a great concentration of towns in the Tel Aviv region; an excessive number of the new, so-called "development towns", some of which failed to attain full urban status; slow urban growth in the Negev and the Galilee; absence of urban settlements in regions where they would be needed.

The author outlines a proposal for an optimal system of Israel's urban development, aimed at correcting the deficiencies in the present system. The proposal is based on weighed values of geographical factors of attraction, on axes of communication and on the existence of ancient settlements. An optimal hierarchy of towns is indicated, and a certain number of towns is proposed for each category.

The need is stressed by the author of directing urban development towards the eastern part of the country, to the southern lowland, to the Jezreel Valley and eastern Galilee. He also points out the locations where no further urban development should be encouraged.

Involvement of local communities in the decisions on their own affairs is dealt with in connection with the town planning aspects of their settlements, in the paper by Prof. Raanan Weitz, Prof. Shmuel Shaked, Zvi Weininger and Steve Reinheimer, on the subject of "Community Approach to Town Planning."

The new approach to planning, is now applied to rural communities, where each individual village is ethnically homogeneous. These villages, grouped around a rural service centre, may be heterogeneous, but each is able to maintain its own coloration and daily life without friction with its neighbors.

The planner of a new town must first know for whom his planning is intended, who are the residents-to-be of the different sections of the neighborhood, their traits, family structure, communal orientation, habits, expectations and requirements. Only established homogeneous communities that continue with their own way of life will achieve social integration.



An essential principle to be applied to urban planning is seen by the authors in the presentation of a clearly defined development challenge. The residents will accept the challenge if the urban section is based on a development plan of their own choosing, and will form an independent and organized social unit in itself. Every such section will have a service centre catering for a population distinguished by its own characteristics.

The authors see the experience gained in the course of caring for the rural settlements to have led to the formulation of relationship formats between the settling agency and the people cared for in the rural settlement process. These relationships are undoubtedly of paramount importance in urban development as well. The formats of contact, organization, instruction and motivation, to be found in the rural settlement groupings, must also form the basis of the entire complex process called urban community development.

# Geographic Re-evaluation of Town Distribution in Israel

Elisha Efrat

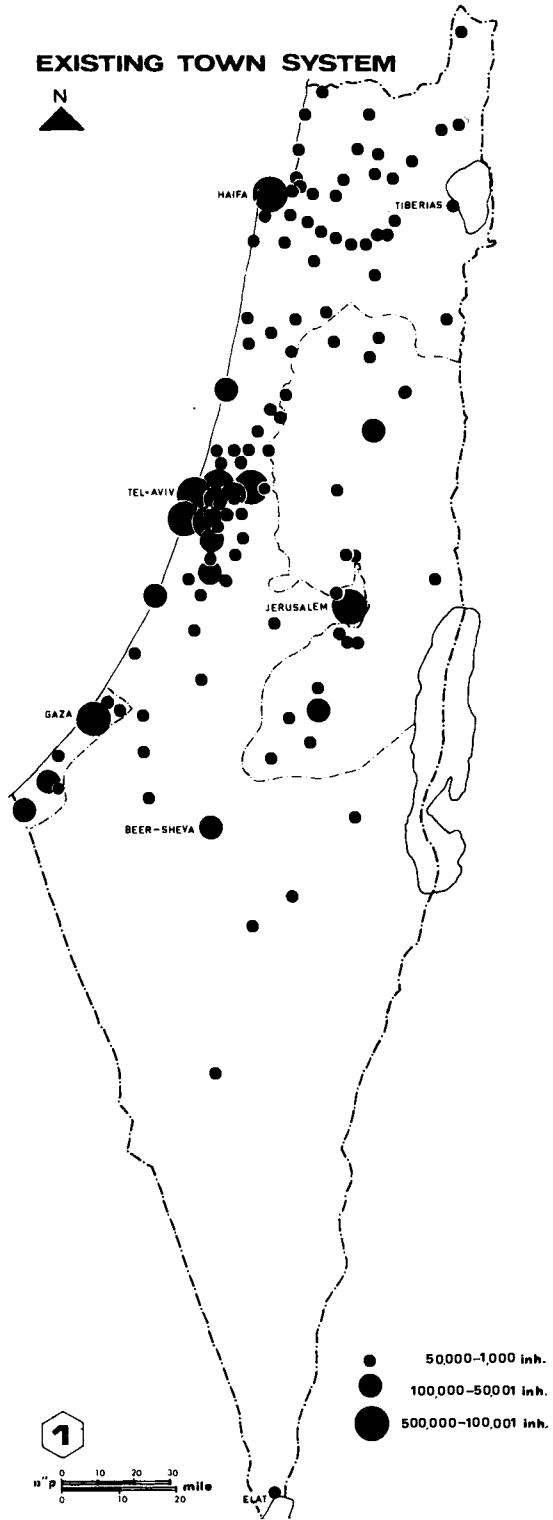
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A feeling prevalent among many of Israel's planners is that, after 30 years of town planning, the optimal town system has not yet been attained, and that the unique opportunity for the creation of such a system, that had existed during the early years after the establishment of the State, was to a large extent missed. This feeling is based on a number of facts, only some of which will be listed here: the exaggerated concentration of large towns in the Tel Aviv region, the excessive number of development towns, the slow urban growth in the Negev and in the Galilee, the failure of semi-urban settlements to attain full urban status, and the absence of urban settlements in many regions where they are felt to be needed. In view of the relatively small size of the country, the predominant (90%) state ownership of the land, and the large areas allocated for physical development, it should have been possible to achieve a planned and balanced town system that would adequately serve the needs both of the inhabitants and of the Government. One may also have expected that the planning of the town system would be based on sound regional geographical principles, and that it would consider several alternative solutions of the problem of urban distribution.

Since the process of establishing new towns and consolidating the town system has not yet been completed, it would be useful to examine the existing system against the background of an optimal system of urban settlements, with a view to discovering the weak points of the existing system, and to pointing out those links of the urban distribution pattern that are in need of correction and improvement in the future.<sup>1</sup>

## THE EXISTING TOWN SYSTEM

The present Israel town system comprises 37 settlements that have attained the official status of municipalities, 28 development towns in various stages of growth that have not yet been accorded municipal status, and 24 semi-urban settlements, both Jewish and Arab, with populations of over 5,000.<sup>2</sup> If we consider the whole of Eretz Yisrael, including Judea, Samaria and the Gaza Strip, we must add another 14 larger and 12 smaller towns.<sup>3</sup> Thus, there are 89 towns and urban settlements within the boundaries of Israel, with an additional 26 in Judea, Samaria and the Gaza Strip, making a total of 115 settlements. Their population is distributed as follows: 2,453,600 in towns, 210,800 in development towns that have not attained urban status, 234,600 in semi-urban settlements and 634,100 in the larger and smaller towns of Judea, Samaria and the Gaza Strip. The total urban population in Israel numbers 2,899,000 and, if we include Judea, Samaria and the Gaza Strip - 3,533,100.<sup>4</sup> Thus, we have an urban population potential of close to 3,600,000 inhabitants, with a wide range of demographic components, and a varying economic, social and cultural background.



An examination of the population figures of existing urban settlements reveals the existence of three distinct groups: a) small towns with a population of up to 50,000; b) medium-sized towns with a population of 50,000-100,000; c) large towns with a population 100,000-500,000. The geographical distribution of the towns, according to the above classification, is shown in Fig. 1 and the following points can be noted:

1. In the central part of the coastal plain lies the cluster of 5 large towns constituting the conurbation of Tel Aviv. This conurbation is developing the centripetal power characteristic of a large urban agglomeration, at the expense of the pace of urban consolidation in the peripheral region.
2. There are two other large towns in the coastal plain - Haifa and Gaza, each at a distance of about 100 km. from the Tel Aviv conurbation. A third large town - Jerusalem, is situated on the plateau.
3. There is a large concentration of medium-sized towns near the centre and at the southern periphery of the Tel Aviv conurbation. Netanya and Ashdod, both medium-sized towns, are respectively situated north and south of the Tel Aviv conurbation. In the south of the Gaza Strip are two other towns - Khan Yunis and Rafah.
4. The small towns in the coastal plain form a large and unusual concentration in the vicinity of the Tel Aviv conurbation, within a radius of about 15 km. from the conurbation centre.
5. An additional concentration of small towns is to be found in the north of the country, along two axes: from Haifa in the direction of the northern part of the Jezreel Valley and the southern part of Lower Galilee, and from Haifa in the direction of the central and northern parts of Lower Galilee.
6. In the northern Sharon and the Carmel coastal strip there is a scattering of small towns with no apparent distribution pattern.
7. In the southern lowland the small towns are distributed along two longitudinal axes, one from Ashqelon to Ofaqim, and the other from Yavne to Qiryat Gat.
8. In the Negev there are few urban settlements. Apart from Beersheba, a medium-sized town situated in a favourable geographical location, there are five small towns along the axis Arad-Dimona-Yeroham-Mitzpe Ramon-Elat, the distance between them often reaching or even exceeding 50 km.
9. North of the Beersheba valley, on the mountain plateau, we find a linear distribution of towns, with a cluster of small towns north and south of Jerusalem.
10. In the Jordan Valley, there is a sparse linear distribution of small towns, from Qiryat Shemona in the north to Jericho in the south.
11. There is a comparatively dense concentration of Arab urban settlements along the "Green Line".
12. There are no towns in the upper lowland or along the western edge of the Hebron Hills.

13. There are no urban settlements in the eastern part of Lower Galilee.

14. The number of small urban settlements in the Galilee is noticeably larger than the number of such settlements in the Negev.

15. The Gaza Strip is exceptional as regards the number of its medium-sized towns, which is out of all proportion to the small area of the strip.

#### THE OPTIMAL TOWN SYSTEM

In order to appreciate the lack of balance in the events that have given rise to the town system as it exists today, it will be useful to plan an optimal town system that will meet the following conditions: a) It will apply to the same geographical area and to the same population as the existing system; b) It will be planned on a geographical-regional basis; c) It will deal with urban groups according to the classification given above; d) It will define the stages by which it will be possible to proceed from a theoretical to a realistic optimal system.

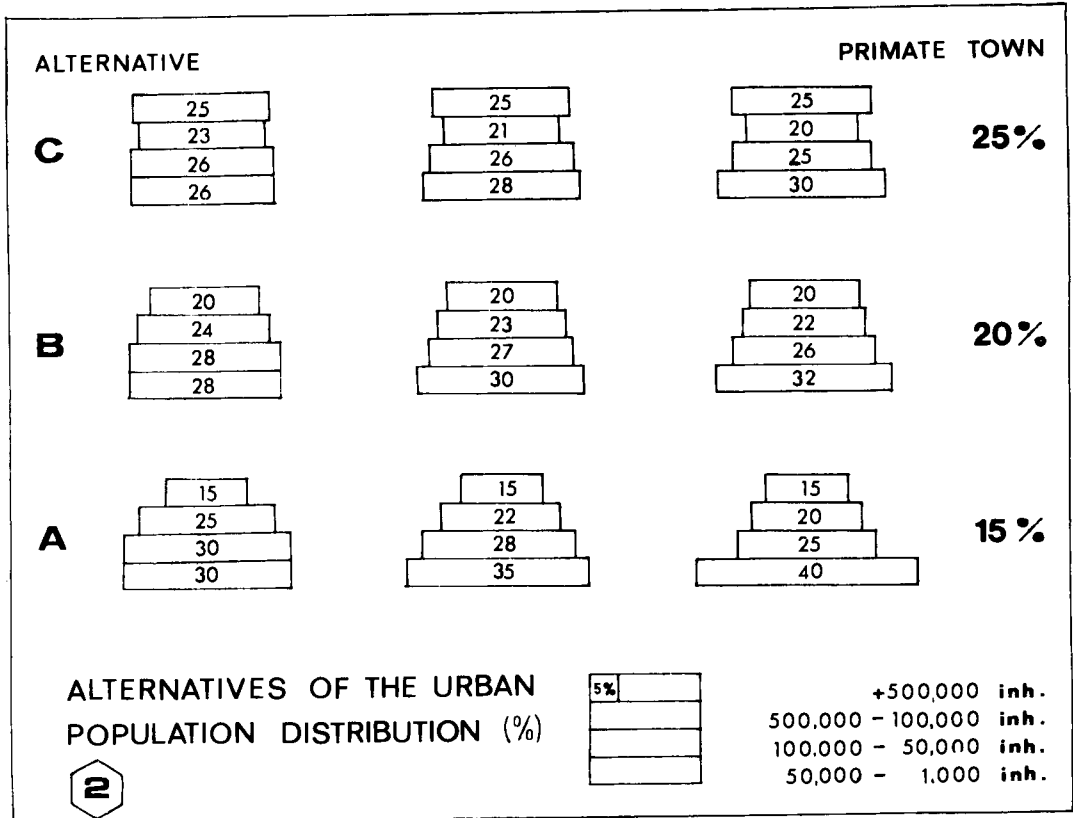
After having thus arrived at a realistic optimal town system, it will be possible to compare it with the existing system and to discover the latter's shortcomings, both as regards their nature and their importance. Let us, therefore, develop such an optimal town system, by determining the urban hierarchy, apportioning the number of towns to each of its grades and determining the spatial distribution of the towns on the basis of various geographical criteria.

#### THE PRIMATE TOWN AND THE POPULATION DISTRIBUTION IN THE URBAN HIERARCHY

Planners in Israel since the beginning of statehood, adopted the view that the optimal town system of the country should be based on a reasonable urban hierarchy, which would represent the size and the number of the towns in terms of an urban pyramid, which would also express the proportion of the urban population to be found in each size-class. Let us, therefore, follow this conception of town distribution as a basis for re-evaluation of that system.

A priori there are many alternatives in creating urban hierarchies. If, however, we start with the assumption that the optimal system must include a primate town at the head of the urban hierarchy, it follows that the number and size of the remaining towns will follow a determined and gradual pattern. Having determined the necessity for an urban hierarchy, it is also necessary to make a decision regarding the optimal size of the primate town. This is an important factor, as it will in turn enable us to determine the population of all other grades in the hierarchy, as well as the average population of the towns in each grade. A priori, it would seem to be possible to assign any arbitrary size to the primate town. In reality, however, the population of existing primate towns ranges from 10% to 40% or more of the total urban population, according to the economic and social development of the country, and its historical and political past.

An examination of the ratio of primate towns to the total urban population of a number of developed and progressive countries, shows it to be in the neighbourhood of 20%.<sup>5</sup> Despite some wide divergences from this figure, we can accept it as a reasonable ratio.



If we adopt the above figure of 20% and aim at an urban pyramid in which each descending grade will contain a greater population than that of the grade preceding it, we will have the choice of a number of alternatives, according to what proportion of the total urban population of the country will be contained in each grade in the pyramid. There are some variants of an urban pyramid whose primate town contains 20% of the total urban population (Fig. 2), each variant being based on different values for the population of each grade.<sup>6</sup> In our case only the second and the third variants show a real pyramid grade. Whereas there is no great difference between them, let us choose, arbitrarily, the third variant for further elaboration. According to this alternative, if the population of the primate is 20% of the total urban population of the country, the population in the second grade of the pyramid will be 22%, that in the third grade 26% and that in the fourth grade 32% (Fig. 2). For a total population of 3,600,000 the distribution among the various grades will be as follows (Table 1):

TABLE 1 Distribution of Urban Population according to Grades of the Urban Hierarchy

<u>Grade</u>	<u>Percentage of Total Urban Population</u>	<u>Population</u>
1	20	720,000 <sup>1</sup>
2	22	792,000
3	26	936,000
4	32	1,152,000

Note<sup>1</sup>: The calculation is made from grade 4 upwards, so that the size of the population above 500,000 remaining for grade 1 is 720,000.

In order to find the number of towns which are possible in each grade we have, first of all, to calculate the averages of the distinct urban population groups (Table 2).

TABLE 2 Urban Population Groups and Their Average Sizes

<u>Urban Population Group</u>	<u>Group Average</u>
500,000	720,000 <sup>1</sup>
100,001-500,000	300,000
50,001-100,000	75,000
up to 50,000	25,000

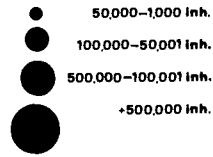
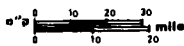
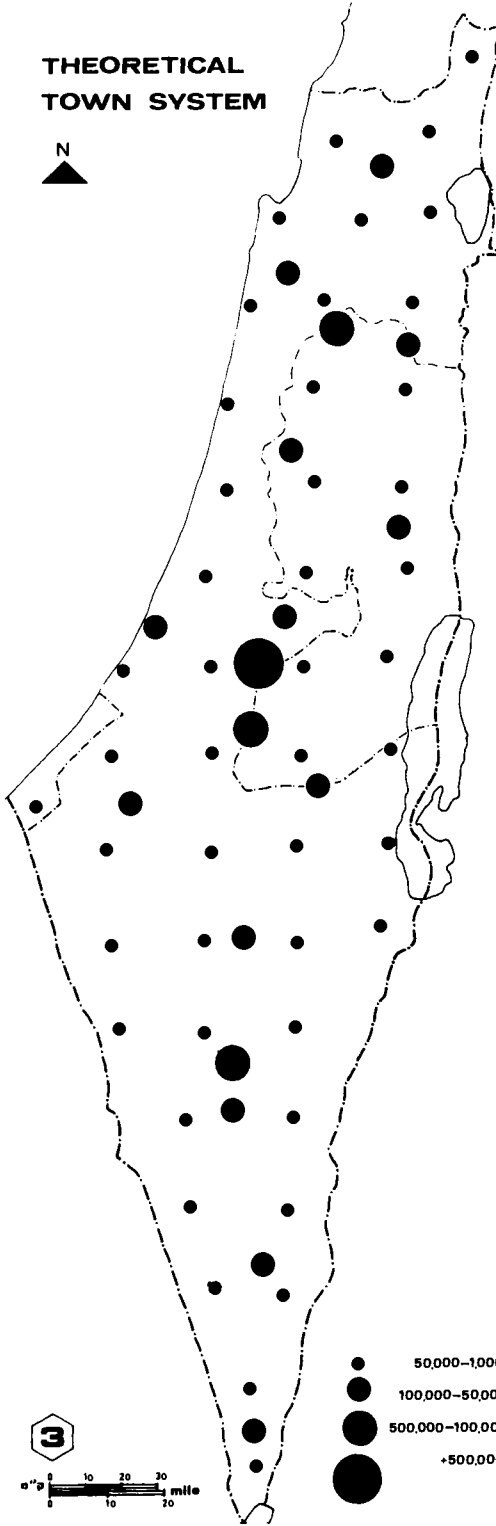
Note<sup>1</sup>: This value is not an exact average. See note 1 in Table 1.

By dividing the population figure in each grade (Table 1) by its group average (Table 2) we find the number of towns in each grade, so that the first grade will have one town, the second grade -3, the third - 13, and the fourth - 46, all together - 63 towns. This number of towns seems to be reasonable for a relatively small country like Israel, instead of the 115 urban and semi-urban settlements which actually exist.

#### THE THEORETICAL OPTIMAL TOWN SYSTEM

If the area of the whole country were level and its geographical character uniform

**THEORETICAL  
TOWN SYSTEM**





throughout, it would be possible to distribute the 63 towns so as to cover the entire area in a geometrical pattern, with equal distances separating towns of similar size. As a starting point, we can plan a strictly theoretical optimal system by subdividing the map of the whole country into several sets of equal squares, the number of squares in each set being equal to the number of towns in each grade of the urban hierarchy. The towns will then be placed in the centers of the respective squares (Fig. 3).

In order to approximate this theoretical system to reality, we must submit it to physical and anthropogeographical tests which will result in the rejection of some of its features and the modification of others. The system must also be examined from the point of view of urban attractability, and this too, will be reflected in the final result. Among the factors working against urbanization must be counted aridity, desert conditions and difficult topography, while the factors favouring urbanization include proximity to the sea, bays, plains and plateaus, as well as human factors relating to a history of settlement, axes of communication, etc.

#### THE "DESERT TEST"

In order to indicate the influence of desert conditions on the optimal and the theoretical town systems, we shall draw on the map of Fig. 4 the mean annual isohyet of 200 mm., which marks the borderline between the desert and the settled area. We can assume that in an arid or a semi-arid zone a comprehensive town system will not develop naturally, as it would in a region enjoying temperate Mediterranean climate. Town systems in desert zones are noted for the following characteristics: a) allow population density; b) urban concentrations in selected focal points which enjoy specially favourable conditions as regards climate, topography, water supply or transport facilities; c) location of the town along a few distinct axes; d) the development of small towns.

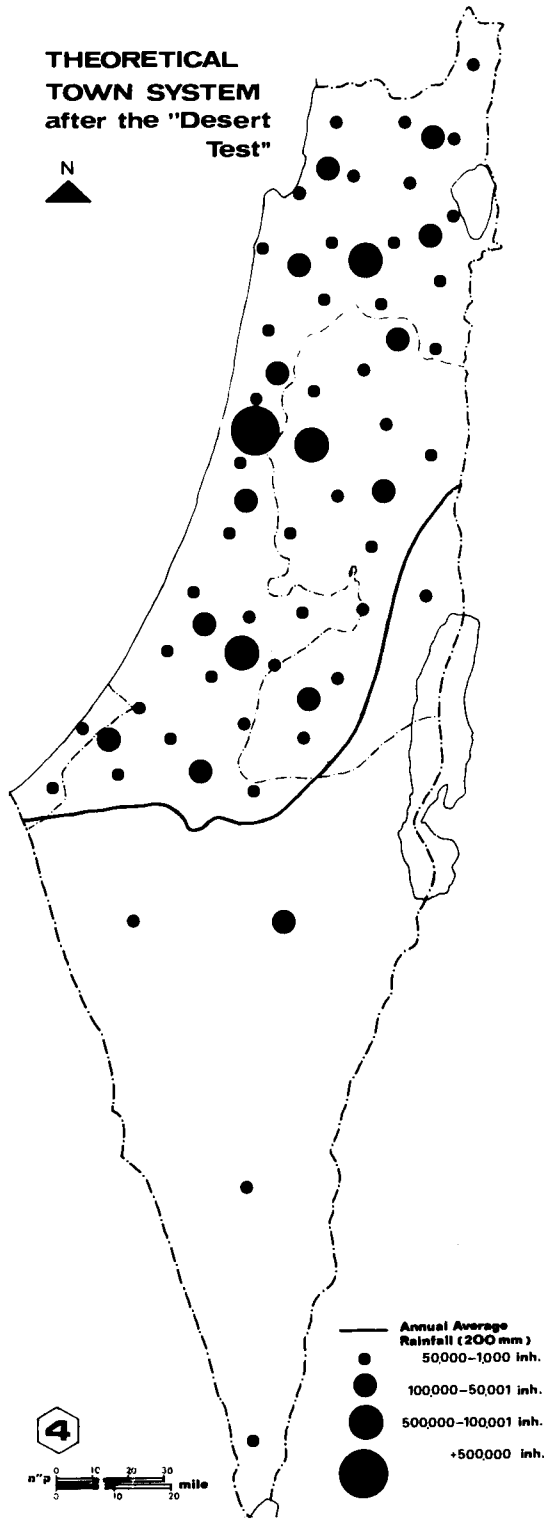
In order to assess the chances of the natural development of urban settlement in the Negev, we have examined the population density data of a number of desert regions similar to those found in Israel (Table 3).

TABLE 3 Density of Population in Various Desert Regions<sup>1</sup>

<u>Region</u>	<u>Population Density (inh./sq.km.)</u>
Transjordan	2 - 20
Northern & Western Anatolia	20 - 40
Central Spain	2 - 20
Northern Sahara	2 - 20

Note<sup>1</sup>: According to Atlas of the Arab World, Djambatan, Amsterdam, 1960, Population, p. 6

On the basis of the above quoted figures, we can assume an average population density for desert regions of 15 inhabitants per sq. km. The area of Israel's desert, below the 200 mm. isohyet, is 12,500 sq. km., and it follows that its potential urban population could reach 187,000. Since desert towns, as a rule, are small, it is proposed that the Negev towns should belong to the third and fourth grades, i.e. one primate town in the higher grade and four towns in the lower grade.<sup>7</sup> As natural conditions do not favour the establishment of many towns in the desert, it will be reasonable to transfer the remainder of the towns of the theoretical



system to the region north of the limit of aridity, which is more suitable for urban settlement.

#### THE "TOPOGRAPHICAL TEST"

We have already noted that a mountainous topography may be another factor limiting the free development of a town system. We have therefore marked on the map all those areas north of the limit of aridity that lie above the +300m. or below the -100m. contours, the assumption being that in these areas the steep slopes and the dissected nature of the terrain prevent the development of a comprehensive town system. The correctness of this assumption is confirmed by the experience of other mountainous Mediterranean countries, such as Italy, Southern Spain, the North African countries and Turkey, where, in most cases, the continuous distribution pattern of towns stops above the +300m. contour.

In order to arrive at an estimate of the population density and the size of towns in mountainous regions, we have examined the population statistics of the Atlas Mountains and the mountainous regions of Turkey, Greece and Spain.<sup>8</sup> The average population density in these regions is 100 inhabitants per sq. km. Applying this figure to the 5,700 sq. km. of mountainous region in Israel (outside the Negev), we arrive at a potential urban population for this region numbering 570,000 inhabitants.

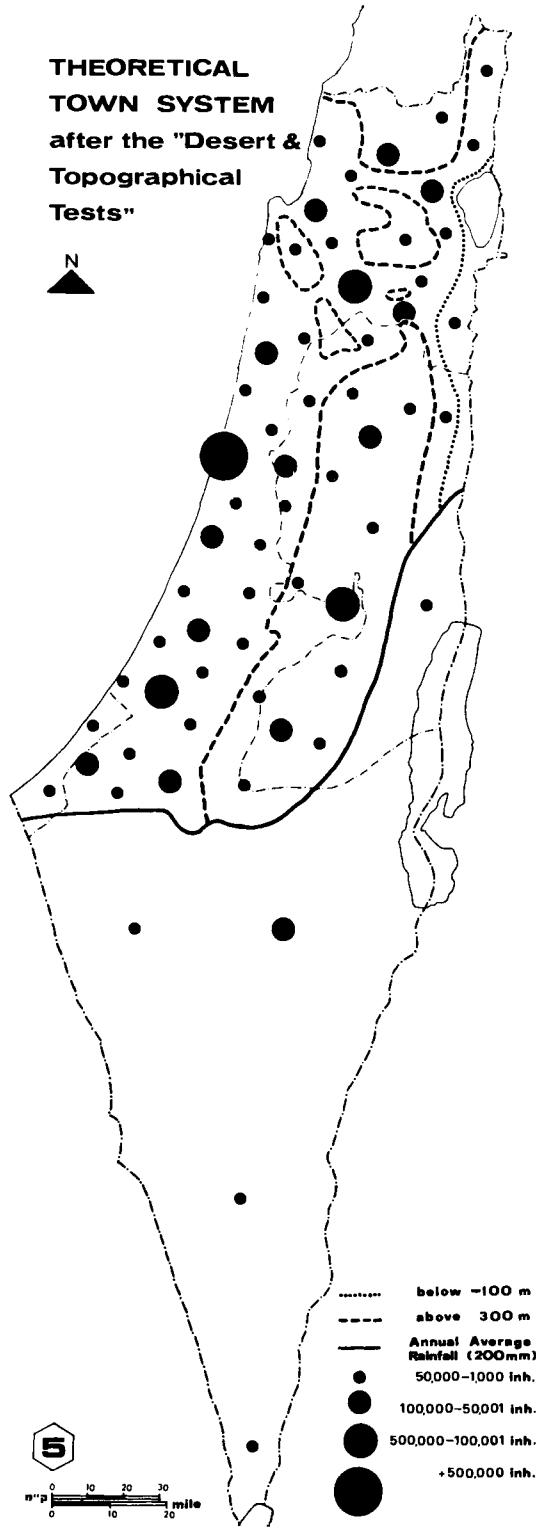
When we come to the problem of how to divide this population potential into groups of towns, we must first decide on the appropriate size of the primate town in a mountain region. The above quoted statistics regarding Mediterranean countries show that most large towns in the mountainous regions, with the exception of national capitals, fall within the 100,000 - 200,000 category.<sup>9</sup>

If we apply these findings to Israel, it follows that the primate town of the mountainous region will belong to the second grade, and the remaining towns to the grades below. If there is only one primate town, then, in an urban pyramid with  $k=3.5$ , there will be three towns in the third grade, and 13 in the fourth grade, a total of 17.<sup>10</sup> Figure 4 shows the equal area distribution of the hill towns according to this division into three grades.

After having apportioned five towns to the Negev and 17 to the mountainous regions, we are left with 41 (out of the total of 63) towns in those areas that have a regular topography and enjoy a climate that encourages urban settlement. Of these 41 towns, one will belong to the first grade, two to the second, nine to the third and 29 to the fourth. If we distribute these towns on an equal area basis, we shall obtain the complete optimal system shown in Fig. 5.

After having submitted the theoretical optimal system to the "desert test" and to the "topographical test", we shall have obtained a town system that is closer to geographical reality, and the main features of which are:

1. Very sparse distribution of towns in the Negev and in the Judean Desert.
2. Moderate concentration of towns in the hilly region.
3. High concentration of towns in the coastal plain.
4. The tendency of two towns of the second grade, one in the north of the country and one in the south, to be located in the coastal plain, but not necessarily in its western part.
5. The presence of one large town of the second grade in the hilly region.



6. The tendency of Israel's primate town to be situated in the central part of the coastal plain, close to the seashore.

#### THE "URBAN ATTRACTABILITY TEST"

##### Physical Factors

As against the physical factors that inhibit urbanization and have therefore a negative influence on the theoretical optimal town system, there are other factors that favour urbanization and impart new directions to the distribution of towns: Among the physical factors that attract urbanization are the following:

- a) Level terrain from the coastline to about 5 km. inland.
- b) Level terrain bordering on a bay.
- c) Fertile agricultural plain lying below the +300m. and above the -100m. contours.
- d) Mountain plateau.

The above factors differ regarding their urban attractability, and it is necessary to assign them different "weights" according to their nature and to their extent in the field. We have therefore drawn on the map of the country (Fig. 6) the limits of five categories of areas having different degrees of urban attractability:

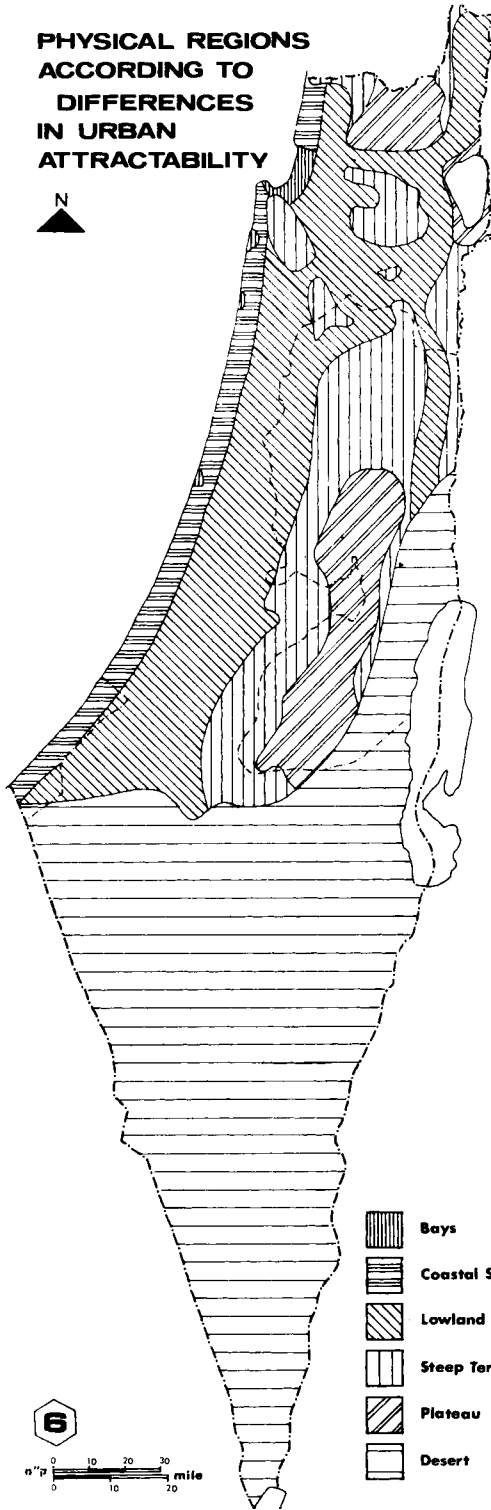
- 1) 5 km. wide coastal plain bordering on a bay.
- 2) 5 km. wide coastal plain, without bays.
- 3) Inland plain below the +300m. and above the -100m. contours.
- 4) Steep and dissected mountainous terrain above the +300m. or below the -100m. contours.
- 5) Plateau situated at over 600 m. above sea level.<sup>14</sup>







In respect of the above regions we have calculated for each its relative area, as a percentage of the total area of the country north of the limit of aridity, its relative share of the total population potential, the weighted relative area and the weighted relative population of each (Table 4).

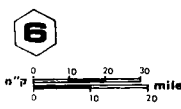
TABLE 4 Distribution of Population in Regions according to Factors of Urban Attractability

Region	Relative Area	Share of Population <sup>1</sup>	Urban Attractability <sup>2</sup> Factor	Weighted Relative Area	Weighted Share of Population <sup>3</sup>	Percentage of Weighted Share
Coastal plain with bays	1.7	48,331	4	6.8	141,215	5.0
Coastal Plain	15.9	452,037	3	47.7	990,585	34.8
Inland Plain	82.4	2,342,632	1	82.4	1,711,199	60.2
Total:	100.0	2,843,000		136.9	2,843,000	100.0

**PHYSICAL REGIONS  
ACCORDING TO  
DIFFERENCES  
IN URBAN  
ATTRACTABILITY**



-  Bays
-  Coastal Strip
-  Lowland
-  Steep Terrain
-  Plateau
-  Desert



(TABLE 4 continued)

Region	Relative Area	Share of Population	Urban Attractability Factor	Weighted Relative Area	Weighted Share of Population	Percentage of Weighted Share
Mountain-ous Terrain	66.8 <sup>4</sup>	380,760	1	66.8	326,552	57.3
Plateau	33.2	189,240	1.5	49.8	243,447	42.7
Total	100.0	570,000		116.6	570,000	100.0

- Notes:
1. The share of a region in the total population of 2,843,000 is calculated according to its relative area.
  2. An arbitrary factor which assumes that coastal strips are three times more attractive than plains, and coastal plains bordering bays - 4 times.
  3. This value is accepted by calculating the share of the region in the whole weighted relative area multiplied by the total population.
  4. For the mountain area a different calculation was carried out, because it was already limited in a previous stage.

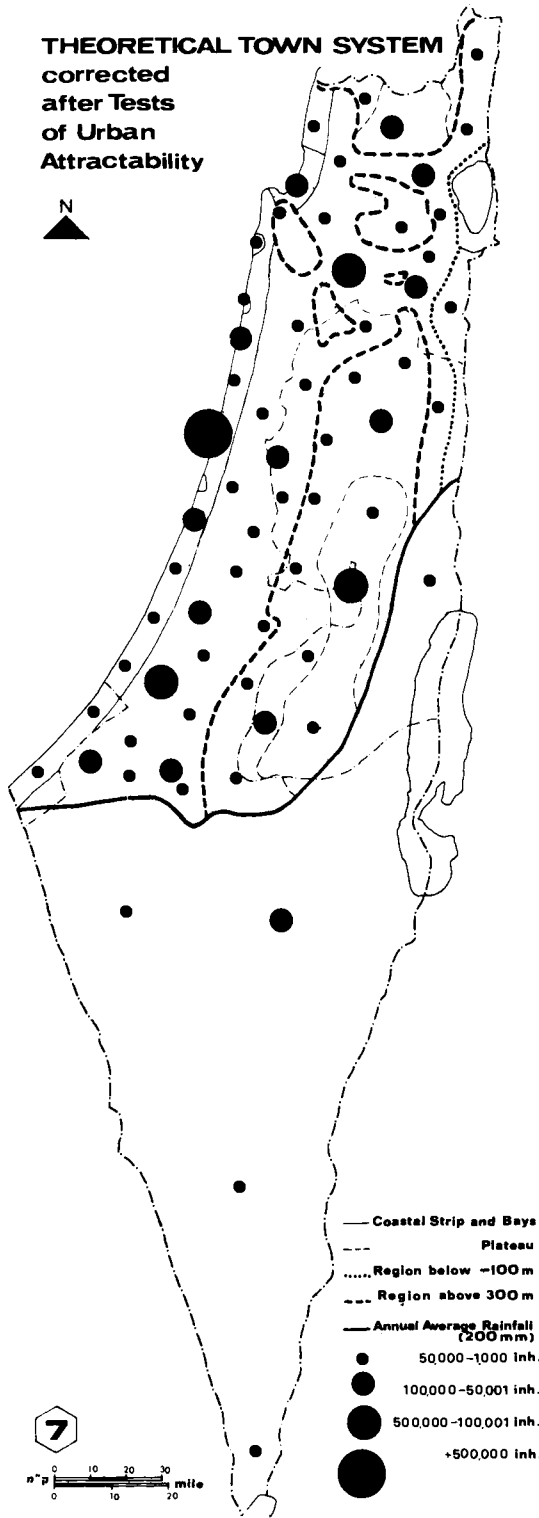
Figure 7 shows the distribution of towns as corrected after the above tests of urban attractability, which stress the concentration of towns along the coastline of towns in the coastal plain.

#### Anthropogeographical Factors

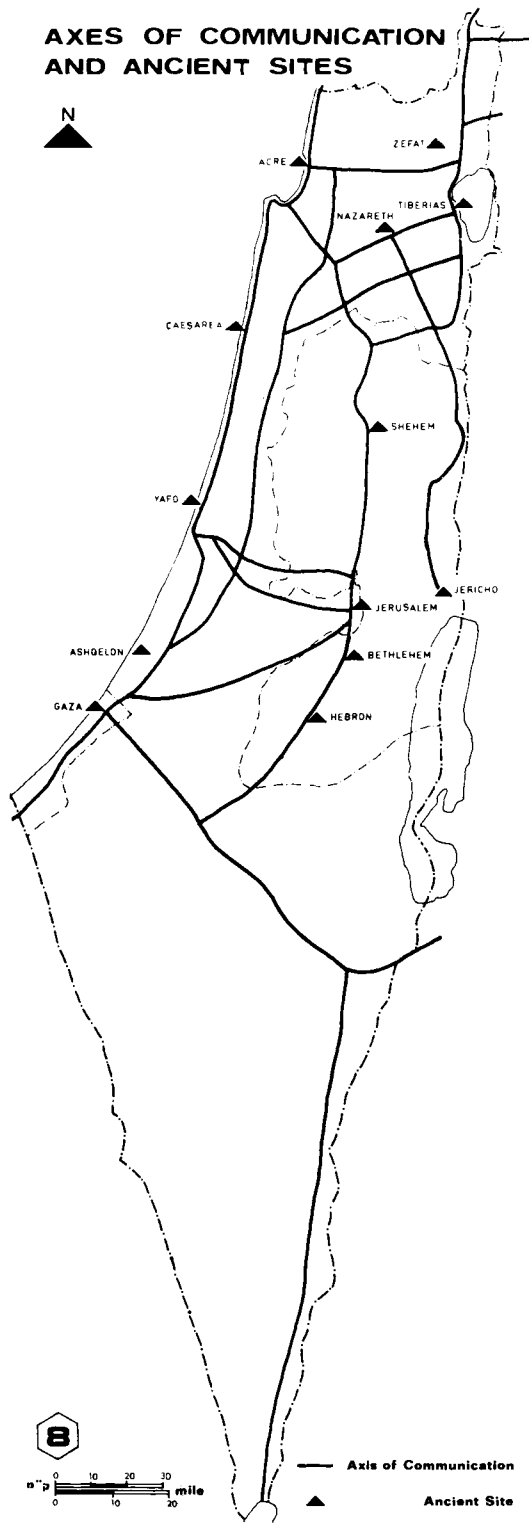
Among the anthropogeographical factors favouring urbanization are ancient towns of historical interest and a communication network going back to ancient times, based on inter-regional geographical and physical differences. The map in Fig. 8 shows the dominant system of axes of communication. These axes include the route from the hilly region to the Jordan Valley and from the eastern part of the coastal plain to the hills, the plateau extending from the Hebron Hills to Galilee, the Jezreel Valley, etc. The map also shows ancient historic town sites which can serve even today as centers for urban development. Among them are Akko, Yafo, Caesarea, Jerusalem, Bethlehem, Hebron, Zefat, Tiberias and Nazareth. The town system was modified to take account of the above attractability factors, while endeavouring to keep the displacement of town sites to a minimum, and keeping also in mind the geographical urban attractability factors mentioned above.

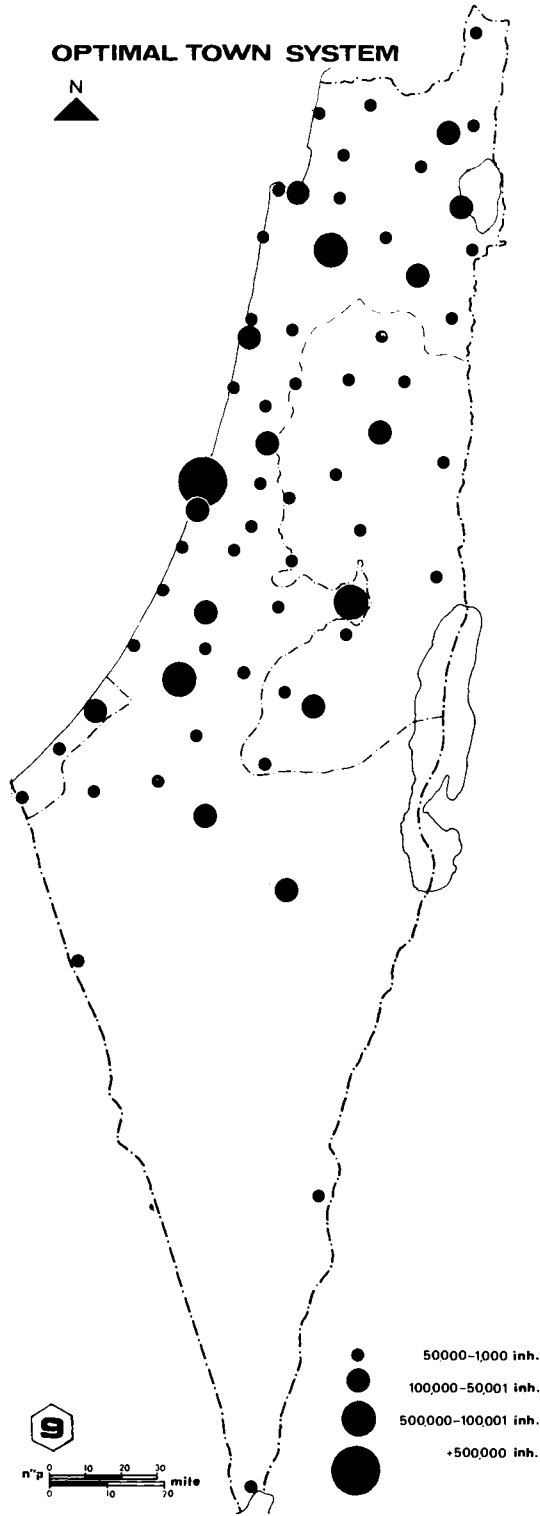
#### THE OPTIMAL TOWN SYSTEM

We have seen how the theoretical optimal town system was subjected to a series of corrections based either on regional considerations, such as the influence of desert or mountains, or on the urban attractability of certain geographical, physical, or human factors. The resulting optimal town system is shown in Fig. 9.









The main features of the optimal town system are:

1. Israel's primate town is situated near the center of the coastal plain, close to the coastline.
2. Along the coastal plain there is room for four medium-sized towns, spaced 40-50 km. apart. One of these towns may develop into a satellite of the primate town.
3. Haifa Bay requires a medium-sized town near its center, and not at the foot of Mount Carmel or at Akko.
4. Along the coast there is room for nine small towns, spaced 20-30 km. apart.
5. There is room for a denser town system along the eastern edge of the coastal plain, at the foot hills.
6. In the coastal plain there is need for two towns of the second grade, one at the boundary between the coastal plain and the Jezreel Valley, and the other in the lowland.
7. There is room for three towns of the third grade in the eastern Sharon, the northern lowland, and in the center of the Beersheba Valley.
8. The average distance between the line of coastal towns and the line of towns along the eastern axis is about 10-15 km.
9. The distribution of towns in the hilly region will not be linear, but dispersed, with an average distance of 20-30 km. between towns.
10. On the plateau there is room for one large town in the Jerusalem district and two medium-sized towns, one in the Hebron hills and the other in the Samaria hills.
11. In the Galilee there is room for two medium-sized towns, one in the eastern part of Upper Galilee, and the second in the eastern part of Lower Galilee.
12. There will be groups of small towns in the eastern part of the Hebron hills, along the east-west axes of the Samaria hills and in the foothills of Upper Galilee.
13. In the Jordan Valley there is room for one medium-sized town on the shores of the Sea of Galilee and six small towns spread along the north-south axis and spaced about 30-40 km. apart.
14. In the desert area there is room for five towns, one of these, in the Dimona region, will be a central town of the Negev, while the others will be strung out along the Arava and the important axes of communication.

#### COMPARISON BETWEEN THE OPTIMAL AND THE EXISTING TOWN SYSTEM

In order to compare the optimal and the existing town system (Fig. 1 and Fig. 9), a number of tests were made using the Chi-Square method, which expresses by means

of the formula:

$$x^2 = \frac{(O-E)^2}{E}$$

the measure of the change, the distortion or the contraction of a system of points when compared to a random spatial distribution.<sup>15</sup> The four tests carried out according to this method included the comparison of the optimal and the existing town systems of the whole country and then of the State of Israel when Judea, Samaria and the Gaza Strip were excluded. The two last tests were concerned with determining the degree of distortion of the town system within the State limits of the "Green Line". The tests showed the following results:

1. The value of  $x^2$  for the optimal system is 69.35<sup>16</sup>, and that of the existing system 258.17, i.e. a distortion factor of 3.72.
2. Taking the area within the "Green Line" only, the value of  $x^2$  for the optimal system is 61.37, as against 246.7 for the existing system, i.e. a distortion factor of 4.02.
3. Two additional tests made in respect of the optimal and existing system in Judea, Samaria and the Gaza Strip, gave values of  $x^2 = 8.25$  for the optimal system and  $x^2 = 21.03$  for the existing system, i.e. a distortion factor of only 2.55.

The following conclusions can be drawn from the above results:

1. The town system in Israel upsets to a marked degree the natural and optimal balance that could have been attained, the distortion factor from the optimum reaching a value of almost 4. It can be assumed that this high rate of distortion was caused by the concentration of towns in the vicinity of Tel Aviv and the building of a large number of small towns in the Western Galilee and in certain parts of the southern section of the coastal plain, as well as by the lack of many towns in the Negev and in the hill region.
2. The lack of balance between the optimal and the existing town system is even more striking if we consider the values of  $x^2$  within the limits of the "Green Line", which correspond to a distortion factor of over 4. This is probably a result of the influence of an active town planning intervention in the creation of Israel's town system.
3. The comparison of the distortion values within the limits of the "Green Line" (4.02) and outside these limits (2.55), shows that the distortion in Israel is 1.57 greater than in the Administered Territories. It must be remembered that the town system in the Administered Territories was not planned nor was it the result of any deliberate initiative. A "natural" state of affairs developed in these areas as a result of extraneous factors, such as the establishment of the "Green Line", which caused the concentration of a large number of refugees in the Gaza Strip and in the outskirts of existing towns in Judea and Samaria. In the State of Israel, although thought was given to the planning of a town system, outside factors, including the establishment of the "Green Line", contributed to much greater distortion of the existing from the optimal town system than the Administered Territories.

THE GEOGRAPHIC-REGIONAL SIGNIFICANCE OF THE DIFFERENCES BETWEEN THE TWO SYSTEMS

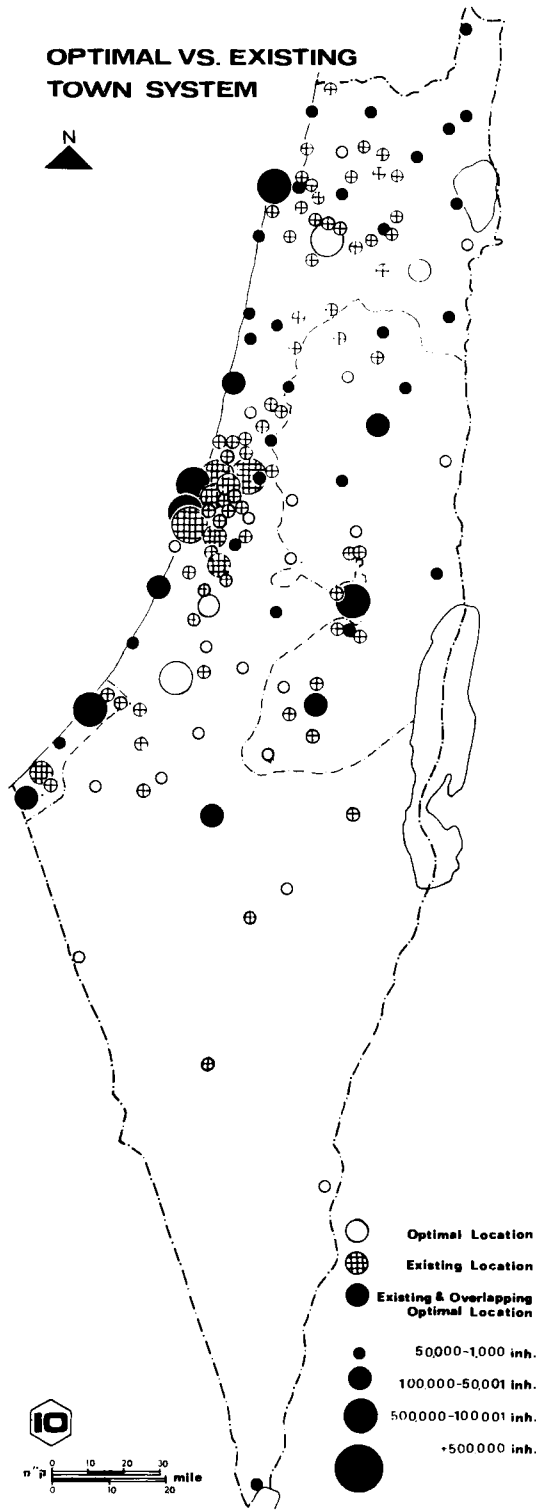
The realization that there are differences between the optimal and the existing town systems, and the possibility of expressing these differences quantitatively, requires us to examine their regional aspect, in order to discover the place where the distortions are particularly pronounced. For the purpose of this examination we have marked on one map (Fig. 10) the towns of both the optimal and the existing systems. The comparison between the two sets of locations was then made according to the following groups: a) The optimal and the existing locations overlap; b) The existing location is not in the proximity of an optimal location; c) The optimal location is not in the proximity of an existing location.

The comparison of the two systems shows that:

1. Most of the overlapping locations are to be found along the coast and along the central mountain ridge.
2. Most of the existing locations that are not near an optimal location are to be found in the Tel Aviv conurbation and in the western part of Lower Galilee.
3. The only overlapping locations in the Negev are Beer Sheba and Dimona.
4. Most of the existing locations beyond the "Green Line" which are not near an optimal location, are to be found in the vicinity of Jerusalem and in the Gaza Strip.
5. Most of the optimal locations that are not near an existing location, are to be found in the western part of the Jezreel Valley, in the eastern part of Lower Galilee, in the northern and southern parts of the Judean lowland, in the access routes from the lowland to the hills and in the Bethel hill country.

The following conclusions can be drawn from the above:

1. In the planning and building of Israel not enough importance was attached to the advantages of regions such as Eastern Galilee and the western part of the Jezreel Valley.
2. Urban development kept too close to the seashore and did not spread sufficiently inland, in the direction of the eastern parts of the Sharon and the lowland, and the foothills.
3. No large town was built in the southern lowland, as a counterweight to the Tel Aviv conurbation.
4. There was no clear policy regarding the location of towns in the central and southern Negev.
5. Any additional towns in Judea and Samaria should be concentrated in the Latrun region and on the northern and western slopes of the Bethel hill country. There is also room for a new town opposite Gesher Adam (Jisr Damiya) in the Jordan Valley.
6. The number of overlapping locations (41) is much smaller than the total (96) of the optimal locations that do not lie near existing loca-



tions (74), plus the existing locations that are not located near optimal locations (22). This is a measure of the fortuitousness in the siting of many new towns in Israel.

7. There are a number of cases in which a considerable number of small towns exist in the vicinity of a proposed large or medium-sized town. For instance, opposite the large town proposed in the southern lowland, lie the existing towns of Qiryat Gat, Sederot and Ashqelon; opposite the proposed town near the Re'em Junction are located the existing towns of Qiryat Malakhi and Gedera; opposite the proposed town at Palmahim there is the urban development to the west and south of Rishon Le Zion; opposite the proposed town in the western part of the Jezreel Valley are Rekhasim, Ramat Yishay, Neshet and Migdal Ha'Emeq; instead of the central town in Haifa Bay there are seven existing towns (the Qerayot).

8. Future urban development in Israel must be based on the locations where both systems overlap, and there must be only a minimum of urban building in existing towns that are not near optimal locations. Any new town to be planned in the future, must be located at the missing links of the optimal town system.

#### FOOTNOTES

1. The author indebted to Mr. Eitan Ofir for his assistance in working out the quantitative data, and for preparing the drafts of the maps, and to Veronika Ronen for her devoted cartographic work.
2. The list of towns and development towns is up-to-date for 1977. The list of settlements numbering more than 5,000 inhabitants, is based on Statistical Abstract of Israel, 1975.
3. According to "Population Distribution in Judea, Samaria, Gaza Strip and Sinai", Ministry of the Interior, Jerusalem, July, 1975.
4. Israel's population data according to Statistical Abstract of Israel, op. cit. Population data for the Administered Areas according to Note 3.
5. A compilation of data concerning primate towns populations, against the urban populations of their countries shows the following rates: Bruxelles - 23.4%, Copenhagen - 18.30%, Helsinki - 21.24%, Athens - 24.06%, Amsterdam - 9.06%, Oslo - 27.62%, Lisbon - 26.96%, Stockholm - 13.64%, Warsaw - 9.31%, Zurich - 15.22%, Capetown - 9.25%, Buenos Aires - 21.31%, Bogota - 25.07%. These rates do not include the suburban population around the towns.
6. In order to project the point, other variants are shown: with a primate town of 25% and of 15% of the population. These variants are unable to create hierarchies with a continuous slope.
7. While the potential population of the whole area is very low, a "primate town" of the third grade was chosen according to an average of 75,000 inhabitants. The rest of the population was divided into towns of the fourth grade, with an average of 25,000 inhabitants.
8. Oxford Atlas, Saul B. Cohen (ed.). Oxford University Press, 1973, pp. 22, 25, 54-55. Atlas of the Arab World and the Middle East, Djambatan, Amsterdam, 1960, Population, p. 6; V. Showers, The World in Figures, John Wiley & Sons, N.Y., 1975, pp. 257, 271-272, 276.

9. *op. cit.*

10. It is hard to assume that the  $k$  value in the mountainous area will remain 3.5. Actually it will be much lower. The primate town for this area was chosen from the second grade with a population of 300,000 inhabitants. Three towns of the third grade with an average of 75,000 inhabitants in each, which makes 225,000 inhabitants, were determined. The remaining 13 towns will get a smaller population than the group average of 25,000. They will be considered as big villages with a population of 5,000 in each.

11. It may be assumed that a mountainous plateau will attract more towns than a lower but dissected region.

12. Distribution of points in a space can be represented in several ways. There are even a few ways to express the rate of clusterization of points against random dispersion. See: J.P. Cole and C.A.M. King, *Quantitative Geography*, John Wiley & Sons, N.Y., 1968, pp. 178-179.

13. It should be remembered that the optimal system is not definitely regular, and after certain limitations cannot reach the value of  $x^2 = 0$ , but  $x^2 = 69.35$ . Therefore, the relative rate between the optimal town system and the existing one is more important.



# Community Approach to Town Planning

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## THE PLAN IN BRIEF

This plan proposes to implement a new form of urban settlement at Ma'alot in the Western Galilee Hills. The settlement model is based on the principle of "Group Absorption" of new olim and Israelis. The economic plan of the project calls for the development of a science and industry center which will include the participation of investors and entrepreneurs from the diaspora as well as from Israel. The first 1,000 families are to be settled within four years of project initiation.

The project is to be implemented in an integrated and comprehensive manner. The physical and social plan will be designed for the settlement of homogeneous communities of olim and veteran Israelis who will organize as groups previous to their aliya and settlement. The location proposed for the project near Ma'alot has been determined by national and regional development needs, as well as attractiveness of location.

The Galilee is an area of high development priority and there is the need to enlarge Jewish settlement there. The vision of Galilee settlement can present an exciting challenge to young Israelis and to many Jewish groups in the diaspora. The plan will be prepared in cooperation with representatives of groups to be settled there and also in consultation with senior scientists and industrial entrepreneurs from the diaspora and Israel.

A special body will be established common to the Jewish Agency and the Government, with the authority and budgets to implement the plan as required by the development timetable. The project is to be under the patronage of the President of Israel, Professor Ephraim Katzir.

## Project Goals

- To increase the level of aliya to Israel by offering a new form of urban living and by presenting challenges to new immigrants. In contrast to existing plans of settlement in new towns based on the absorption of individuals and families, this project is based on the principle of "group settlement" which will create a social framework better adapted to the needs of new olim.

- To settle and to develop the Western Galilee Hills. This project is to be part of the larger plan which includes increasing Jewish settlement within the framework of the "Northern Project." The larger plan includes the extension of rural settlement by means of establishing industrial villages and developing urban settlements linked together by a network of sophisticated industries and services.

- To expand Israel's science-based industry. In order to remedy Israel's balance of payments deficit, export production must be increased. Science-based industries are a major potential for foreign currency earnings. The project is to engage the active participation of industrial entrepreneurs from the diaspora as well as groups of immigrants and Israelis with specific technological and scientific skills.

The experience gained by implementing the "group absorption" model will provide a basis for the reorganization of the aliya and settlement process for urban areas.

#### Components of the Plan

- The development of a new suburban neighborhood adjacent to Ma'alot. The residential development located in the forested Galilee Hills will be so designed so as to take advantage of the natural landscape, thereby insuring a quality of environment which will add to the attractiveness of living in the new community.

- The creation of conditions for the social consolidation of the settling groups. This includes particular organization of the groups on a homogeneous basis - including country of origin and professional interests - will begin during the early planning phases. Their organization as groups and cooperation through their representatives will facilitate the active involvement of the future settlers in the planning process.

- The development of infrastructure for the establishment of science-based industries and special services. The plan will require the active involvement of entrepreneurs from Israel and the diaspora for industry and special services development; and also of groups of olim and of veteran Israelis possessing scientific and technological skills who will come to settle in the new community.

- There will be continuous following of the absorption and planning process by a research team of the Settlement Study Centre so as to provide feedback to the planners, thereby helping to ensure successful project implementation.

#### MAIN PROJECT COMPONENTS

##### Group Settlement and Neighborhood Organization

This plan proposes a comprehensive solution for the settlement requirements of new olim and Israelis. The model for the planning conception is based on the experience gained by the Settlement Department in rural development. A major lesson learned from village planning is that settlements populated by culturally homogeneous groups which were involved in the planning process, ensured a higher rate of successful absorption for its members. We propose to transfer the principle of "group absorption" to urban settlement. The physical implementation will help effect the organizational objective of group absorption and settlement by means of a three-tier urban hierarchy.

The plan proposes the establishment of a number of "Residential Sections" of 800-1,000 families each. These "Sections" are composed of 4-5 homogeneous "Community Groups" of 150-250 families each. The "Greater Neighborhood" planned for 5,000 families includes 506 such "Residential Sections."

The Neighborhood Hierarchy

The Community Group - 150-250 families

The Residential Section - 800-1,000 families (comprised of 4-5 community groups)

The Greater Neighborhood - 5,000 families (comprised of 5-6 residential sections)

The basic absorption and settlement level is the Community Group. The Groups will develop from a garin (nucleus) of 40-50 families sharing a similar cultural background and/or professional interests. Each of the Groups will be encouraged to develop a well-organized community life. Integration among the different Groups shall be facilitated within the two higher levels of organization - the Residential Section and the Greater Neighborhood. The function of the higher levels of organization, in addition to being vehicles for integration is to permit the Community Group to receive higher level public services (including educational and cultural facilities which they alone, as a single group, could not support.

The population size of each Residential Section is planned to be sufficient for an elementary school. This will ensure that the parents will be able to influence the educational program of their local school. At the level of the Community Group and Residential Section, there will be the opportunity for the settlers to develop cultural and religious facilities according to their specific needs.

On the level of the "Community Group" and of the "Residential Section" there will be the opportunity to form consumer cooperatives for the purpose of developing cultural and sport facilities. There will also be the possibility of establishing small scale economic enterprises in the neighborhood. In this way the groups will have the ability to organize and develop their community as they desire. The size of the "Residential Section" is determined, among other factors, on the basis of the projected population of school children. This, in order to permit the functioning of an elementary school on a high standard in each Residential Section and to assure the influence of the parents on the program of the local school. In the residential section there will also be the opportunity to develop cultural and religious facilities according to the specific needs of the various groups. The size of the "Greater Neighborhood" (5,000 families) has been determined on the basis of the population required for the operation of a comprehensive Junior and Senior High School which will include a wide range of educational and professional courses.

The neighborhood will be developed in a gently sloping forested area. The residential sections will be located in proximity to each other and connected to the service center (see model of the neighborhood). The varying topography shall enable the different residential areas in which the Community Groups are to be located to have a unique character and style. The residential areas will be characterized by a variety of homes. The houses will be carefully planned and designed so as to ensure attractive suburban living.

The homes will be planned in a manner which will include a variety of possible housing solutions for settlers and groups. Development of the residential area will be initiated in part in advance - before the arrival of the settlers. This will ensure adequate housing for those planning to settle immediately. These homes will also include apartments of different sizes in condominiums.

# THE NEIGHBORHOOD CONCEPTS & TRENDS

EMPLOYMENT - INDUSTRY

NEIGHBORHOOD CENTER - HIGH SCHOOL, CULTURE, SPORTS

NEIGHBORHOOD SECTION

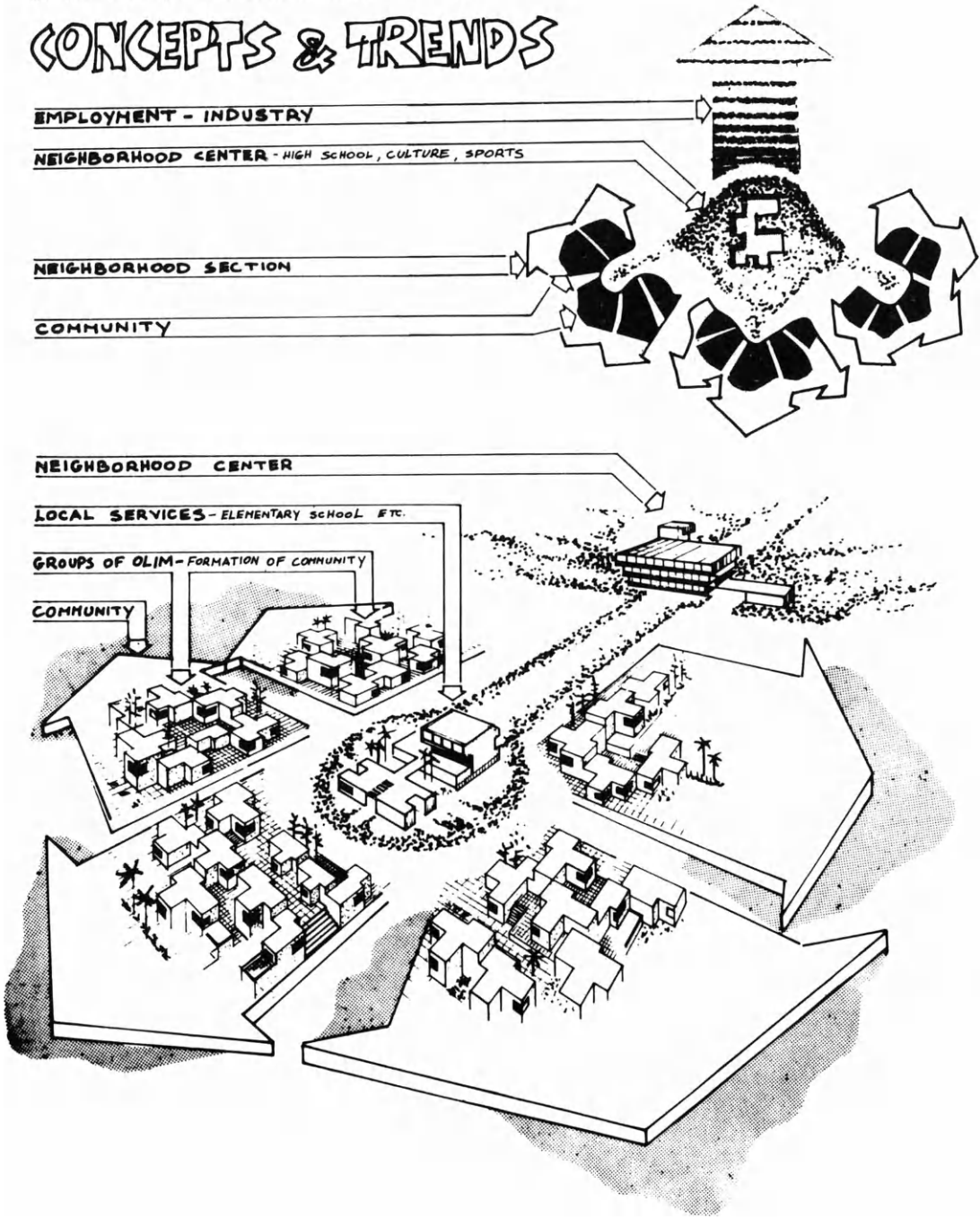
COMMUNITY

NEIGHBORHOOD CENTER

LOCAL SERVICES - ELEMENTARY SCHOOL ETC.

GROUPS OF OLIM - FORMATION OF COMMUNITY

COMMUNITY



Members of groups planning their aliya can jointly design their homes and devise common solutions for their settlement. There will also be the opportunity for individuals to construct homes on the basis of the "Build Your Home" scheme.

In the center of each neighborhood, high-level services will be located, including elementary school, a community center including cultural and sport facilities, shopping center and municipal services. Research institutes are also to be located in the center of the neighborhood as well as small-scale, non-polluting industries. Multi-storey residences will also be constructed in the center of the neighborhood in order to create a "downtown center" effect. The architectural planning will be of high standard and represent a new departure in urban design.

Public buildings will be constructed simultaneously to the home development. This will ensure that the local services will be immediately available to the new settlers.

In order to ensure a high quality living environment, the residence and public service facilities will be located at a significant distance from the industrial center at Tefen.

#### Organization of Groups for Settlement

This plan proposes an approach to settlement different from that in practice today in urban areas. The guiding planning principle is that of group absorption. The comprehensive plan includes the process of group formation overseas and in Israel. The groups will enjoy continuous follow-up until their members' successful settlement in the neighborhood and places of employment.

In place of the current policy of settling new olim in development towns and attempting to integrate them quickly with the local population, the new method proposes to create culturally homogeneous communities and to gradually have the olim meet and mix with immigrants from other countries and with veteran Israelis. Emphasis will be placed on having each community continue the style of life to which it has been accustomed. Integration will be voluntary and be achieved through the medium of common educational institutions, joint social services and places of employment common to all the groups. The process of group absorption will begin in the diaspora - in the organization of the olim and by involving them in a pre-aliya orientation program.

The organization of the first groups of future settlers will be initiated simultaneous to the planning of the neighborhood. To facilitate the formation of groups for settlement a publicity and recruitment campaign will be initiated. Details of the project including opportunities for industrialists and investors in addition to prospective olim will be made available to the Jewish community in the diaspora. Israel Aliya Centers in North America as well as Zionist Federations in the West will organize groups for aliya to the project. A detailed prospectus will be issued for mass distribution.

The implementation unit for the project will include an office of publicity and absorption which will transfer information to communities overseas, providing information to aid group organization prior to aliya. Special newsletters with project details will be distributed to the Zionist Federations and Jewish organizations.

Orientation programs and other preparatory activities will be held in the large Jewish communities and include the operation of Hebrew ulpan and the presentation of details of employment opportunities, and investment in industry and housing.

Future settlers will be able to visit the project site on special "Pilot Tours." This will permit them to view their future residential location, select or plan homes and to be involved in the planning for their group. In addition, ideas for economic enterprises can be evaluated as well as job opportunities explored. This process of involvement in addition to furthering the settlement goals of the group, is part of the process of preparation for life in the Galilee.

Recently there has been a significant upsurge of interest among groups of Israelis in new forms of settlement organization. They seek an alternative form of urban living which poses social and pioneering challenges.

This project proposes such a unique social and settlement framework. Included will be opportunities for young couples of the rural Galilee villages to organize and together plan settlement in the context of the project.

### Economic Planning

The development of science-based industries is to create a sound employment base for the project as well as to make an important contribution to Israel's economy through production for export. Israel is resource poor but blessed with a labor force which has a high proportion of academically trained and skilled manpower. Science-based industries are eminently suited to this labor force and to the employment characteristics of today's aliya. The potential for significant participation of industrial leaders from the diaspora in the development of the Israel economy has hardly been realized. Managers, scientists and engineers with experience in science-based industries, who are located in North America and Europe, should become involved thereby making a valuable contribution to the development of such enterprises in Israel. This economic participation can take the form of joint industrial venture, establishment of subsidiaries, or special licensing agreements.

In order to encourage this involvement, the project will be publicized by means of seminars both in Israel and overseas. The seminar participants will be requested to make proposals and become actively involved in the development of the industrial projects.

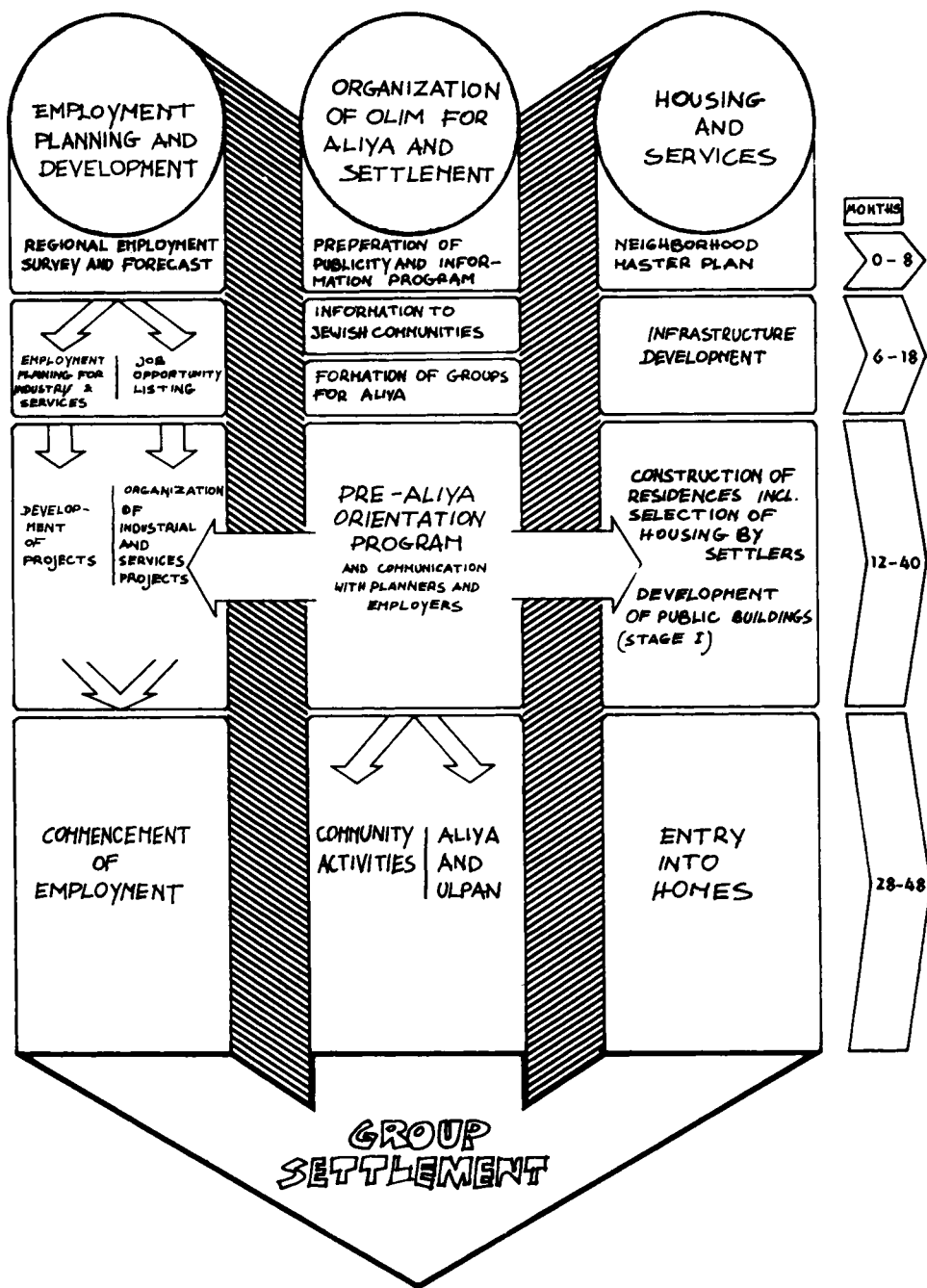
The planning process will be so structured as to permit maximum freedom of action to entrepreneurs and investors. The industrialists, in particular those from overseas, will be invited to participate in the overall planning of the project (industrial and services planning) in addition to the enterprises they themselves propose to erect.

The projects' implementation unit will include a division which will be devoted to approving economic enterprises, appropriation of financial incentives to the investors and furnishing of auxiliary services to the industry.

Small-scale, ecologically-sound industries may, in part, be located adjacent to the residential areas. This will facilitate the employment of housewives and others who wish to work near their homes. Larger scale industries will be located in the modern industrial park now being developed at Tefen, at a distance of several kilometers from the neighborhood. This will insure quality of environment for the settlers.

The industrial park at Tefen is located at a distance of four kilometers south of the proposed site of the neighborhood. At present 175 acres are being prepared for industry. The park will be particularly well-suited for science-based industries and their associated infrastructure. From the site at Tefen there are breathtaking

# STAGES OF PLANNING AND IMPLEMENTATION



views to the West and the Coast, a factor which will add to the attraction of employment at Tefen.

As previously noted, industrial villages will be developed in the rural area between Ma'alot and Carmiel. The larger-scale industries of these cooperative villages are also to be located at the Tefen Park. With the completion of the Ma'alot-Carmiel Roadway, the Park will become a truly regional Industrial Center. In addition to employees from Ma'alot and the industrial villages, the Center will also come to serve as an industrial employment focus of the Carmiel area.

#### Coordination of Project Components

Specific social and economic conceptions have dictated the design of the physical development plan. The flow chart presented here stresses the importance of the three main components:

- Organization of Olim and Israelis for Aliya and Settlement
- Housing and Services
- Employment Planning and Development

The first development stage includes the settlement of 1,000 families within four years of project commencement. The organization of the first groups for settlements both in the diaspora and in Israel will be simultaneous to the initiation of economic and physical planning of the neighborhood. The detailed physical and architectural planning will require 1½ years, however, preparation of the site and beginning of infrastructure development can begin within one year.

#### PROPOSED MANAGEMENT FRAMEWORK

An implementation unit of the Jewish Agency will be created and guided by a coordination body common to it and the Government. This unit will have the budgetary commitments required for plan implementation at the rate determined by the project time-table. The budget shall include allocation for financial assistance and incentives to investors, for the purpose of industrial development.

#### The Initiating Level

The initiating level includes two groups: The Organization Committee of the Government and the Jewish Agency, and a group of public figures from different sectors. This group will include Jewish leaders from the diaspora, members of the Israeli economic leadership, representatives of the academic community, industrialists, leaders in settlement, etc.

#### The Management Level

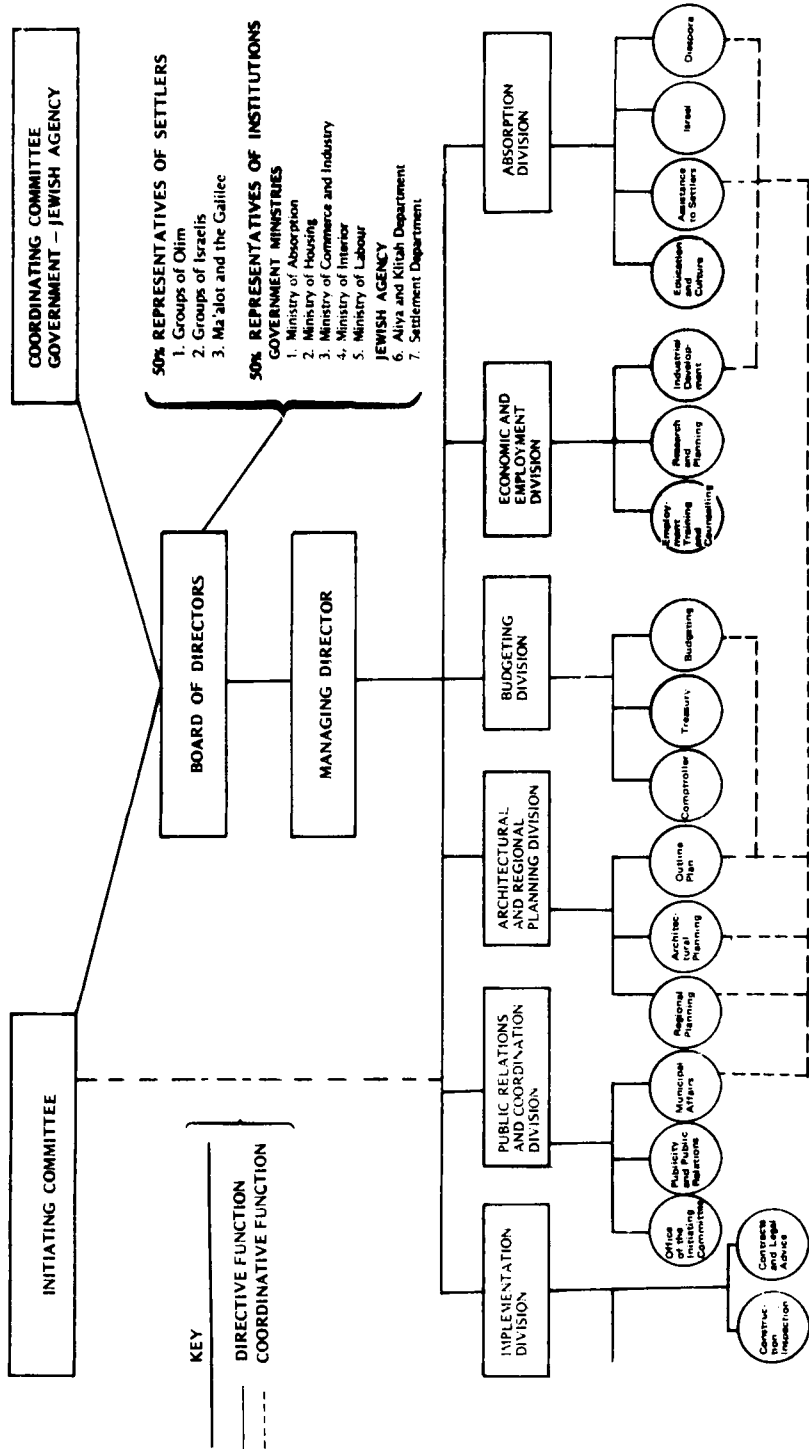
The Management level will be comprised of a Board of Directors whose policies are to be implemented by the Managing Director (Project Manager).

#### The Board of Directors

The Board will be composed in part (50%) by the representatives of the new settlers and of the veteran regional population (Ma'alot and the Galilee). Fifty percent of the members will be representation of the Government Ministries and the Jewish



PROPOSED ORGANIZATION STRUCTURE



Agency will be at the General-Director level.

### Project Management

The Board of Directors will appoint the Managing Director who will also be an ex-officio member of the Board. The operational management will be effected by six divisions (see organizational structure).

Absorption division. This division will have responsibilities which will include recruitment of settlers and their organization prior to and during their settlement at Ma'alot. This division will attend to the social, cultural and educational needs of the new communities.

The division will coordinate employment with particular emphasis on assistance to new settlers during their early period of settlement at Ma'alot.

Budgeting Division. This section will have budgeting responsibilities and associated financial activities including treasury accounting, etc.

Planning division. The planning division will direct the physical, architectural and environmental planning of the project. It will also coordinate the physical development (homes, services, etc.) with the desires and needs of the settling groups.

Public relations and coordination division. This division will coordinate and gain the cooperation of other organizations in advancing the project. It will have public relations responsibilities, coordinate activities with municipal and public bodies in the region including the minorities population of the area. A major task will be developing close supportive relationships with Jewish organizations in the diaspora.

Implementation division. The implementation division will be responsible for the development and construction of building and infrastructure. It will arrange contracting with industrialists, developers and members of the settling groups.

### Approximate Investment

The investment is based on a population of 1,000 families and for the initial construction of 1,000 additional living units. At the same time, the program refers to the preparing of the infrastructure for industrial projects to employ 1,000 people. There is no reference to complete the program for 5,000 families. The total investment will not be higher than those acceptable today for town development projects.

TABLE 1 Approximate Investment

Type of Investment	Development of Residential areas: Mill. IL	Total for 4 yrs.	Of this for 1st year
1,000 + 1,000 living units			
Water	1.2		0.6
Electricity	1.0		0.6
Telephone	0.4		0.2
Sewage	3.4	6.0	0.6

TABLE 1 Approximate Investment (cont'd)

	Mill. IL	Total for 4 yrs.	Of this for 1st year
<u>Investment for Residential Infrastructure</u>			
1,000 living units			
Road	9.0		6.0
Water	1.1		0.2
Electricity & lighting	7.5		
Telephone and T.V.	1.8		
Sewage	3.6	23.0	<u>0.8</u> 7.0
<u>Investment for Development of Gardens (incl steps and earch )</u>			
	1.0	1.0	8.0
<u>Investment for Developing Neighborhood Social Services</u>			
	10.0	10.0	43.0
<u>Investment in Dwellings</u>			
IL200,000 for standard unit	200.0		30.0
for each standard unit	280.0		50.0
2. <u>Investment for Development for Industrial Infastrurcture Including Buildings</u>			
It was presumed that the industrial area will fulfill the need for the next four years and will only require certain additions in the development of the infrastructure.			
Completion of the development			
of infastrurcture	10.0	5.0	
Buildings for 1,000 industrial employees	40.0	20.0	
Approximate estimate for 1,000 workers	<u>150.0</u>	<u>35.0</u>	
Total	200.0		<u>60.0</u>
3. <u>Planning and Supervision</u>			
Organization	25.0	10.0	
	25.0	2.0	
	<u>10.0</u>	<u>3.0</u>	
Total	60.0		15.0
Approximation	<u>540.0</u>		<u>125.0</u>

# Migration Patterns and National Settlement Policies

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## INTRODUCTION

Understanding the patterns of interregional migration has long been the focus of attention for economists and urban planners. Recently the studies have been directed towards understanding gross migration patterns<sup>1</sup> rather than net migration. These studies tend to view migration as more than just a process of redistribution of population according to income or other economic differentials but to include social, environmental and political variables (see Sjaastad, 1962 and Greenwood, 1973 for detailed discussion on the use of gross migration rates). The purpose of this paper is to focus on cases where origins and destinations of migrants are not specified, therefore interregional methods are not applicable but data is available only on in and out-migration rates for specific regions. The case involving interregional migration flows has been dealt with extensively by Rogers using matrix methods - (Rogers, 1968).

An important explanation of in and out-migration was offered by Lowry (1966), who claimed, based on data analysis of migration to and from large metropolitan areas, that out-migration was not affected by economic considerations of the origin region. His view of the migration phenomena was of a two-step decision process: an initial decision to move, independent of origin economic situations and then a choice of destination-considering relative economic opportunities at potential destinations. This hypothesis has very strong policy implications, mainly that improving employment opportunities, for example, would not deter out-migrants from leaving a specific region. This viewpoint was supported by the studies of Lansing and Mueller (1967). Beale (1969) included data on nonmetropolitan areas in addition to metropolitan areas, and found that in some cases the rate of gross out-migration increased as the rate of net out-migration increased, contrary to the Lowry theory. The latter theory predicts no relationship between out-migration and net-migration, which is associated with economic factors, but relates out-migration only to forces of turnover. Beale's results, however, supported Lowry's hypothesis for most cases of metropolitan areas.

## IN AND OUT-MIGRATION RATES

The attacks on the Lowry model generally maintain that there is a negative relationship between out-migration and net-migration, but this relationship is less strong than the positive relationship between in-migration and net-migration. Renshaw (1977) uses a measure of "assymetry" to define population turnover:

$$T^* = hI + (1-h)O$$

$T^*$  is turnover,  $I$  is in-migration and  $h$  is an index of "assymetry", representing weights depending on the sensitivity of moving decisions (out-migration) to forces for net migration.

The Lowry theory would suggest  $h=0$ , while standard economic explanations would set  $h=\frac{1}{2}$ , as both in and out-migration affect turnover equally. Renshaw's conclusions are that, based on empiric results,  $h$  would lie between 0 and  $\frac{1}{2}$ . There are many limitations to this analysis, some stated by the author himself, and mainly that we are using net migration without searching for components that affect in or out-migration.

A similar viewpoint on the use of in and out-migration rates was adopted by Cordey-Hayes (1974, 1975), and explained in detail in Cordey-Hayes and Gleave (1973). The main conclusion from these studies was that after establishing a strong positive relationship between both in and out-migration and net-migration, a strong positive correlation was found between in-migration rates and out-migration rates per capita for specific city regions. This led to the idea developed around the supporting empirical data that areas of a growing nature have a high rate of both in and out-migration. This idea implies that most migrants move from a position of economic strength from one region to another after reaching a satisfactory economic position in growing areas. A finding of such nature is, according to Cordey-Hayes (1975), opposed to the inverse relationship discussed previously between in and out-migration rates, as proposed and incorporated in other studies, mainly Forrester (1969), Kadanoff (1972), Roger and Walz (1972). This inverse relationship between in and out-migration has been termed the "push-pull" concept, as shown in Fig. 1.

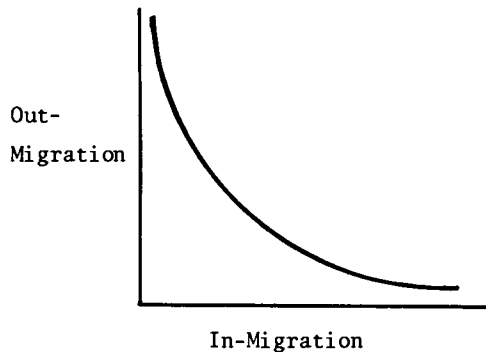


Fig. 1 Inverse Relationship (Push-Pull) Between In and Out-Migration Rates.

#### EMPIRIC FINDINGS ON IN AND OUT-MIGRATION RATES IN ISRAEL

Trying to remain in the realm of the analysis described beforehand (Cordey-Hayes, 1974, 1975, uses interregional in and out per-capita migration rates for 20 city regions in England), we use in and out per-capita migration rates for 14 regions in Israel. The data are based on reports of the Central Bureau of Statistics (1971, 1972, 1973, 1975) for the years 1969, 1970, 1971 and 1974.

The use of city regions is intended to concentrate on labour market areas, but in Israel the migration from rural settlements is negligible in terms of aggregate scales (2%-3%). Since most of the interesting migration patterns occur to and from development towns in all sub-districts, the standard sub-district classification was used. There is no substantial evidence of short distance migration due to life-cycle behaviour. The data were normalized for population size of each

region and therefore per-capita rates are used throughout this paper.

The results of correlating pairs of rates are presented in Table 1. The use of five year average rates (Renshaw, 1977) is not recommended in this case as yearly trends are very important in a dynamic, developing system, such as Israel, which reflect on external changes, government strategies, and economic developments. Three characteristic years were chosen during the period of relative economic and internal stability from 1967 to 1973 (after the Six-Day War until the October War) - 1969, 1970, and 1971. A year assumed to be uncharacteristic of migration patterns is also displayed for comparison purposes (1974 - the year following the October War of Oct.-Nov. 1973).

The results show a positive correlation between in and net-migration per-capita rates for all years, including 1974, as expected. This is in accordance with the standard economic explanation of migration. The correlation between out and net-migration per-capita rates is negative coinciding with Renshaw (1977), and there was no strong relationship found between in and out-migration rates - contrary to the results of Cordey-Hayes (1974, 1975).

For all years, the F test for the correlation coefficients for in and out-migration rates was not significant, thereby suggesting that there is no clear linear relationship between these two rates. The same basic patterns hold for data on additional years analyzed but not shown in this context, suggesting "push-pull" relationships to be prevalent to some extent.

The strong assumption presented that out-migrants move from a position of economic strength from growing regions with high in and out-migration rates is not universally applicable. This is shown through the relationships between in and out-migration per-capita rates for 14 city regions in Israel, as presented in Figs. 2-5, for the four years studied.

Cluster analysis was used to group the regions, using a single sampling technique (based on Sneath and Sokal, 1973), employing linear distances from the national total in and out-migration rates. The computation was based on an algorithm similar to that developed in Veldman (1967). The following five distinctive clusters were found for the years studied and are also shown in Figs. 2-5 :

- Group A - Low in and out-migration rates, close to balance, reflecting low population turnover in stable regions.
- Group B<sub>1</sub> - Average in-migration rates, close to balance, reflecting average growth of regions.
- Group B<sub>2</sub> - Average out-migration rates, close to balance, reflecting average decay of regions.
- Group C - Distinctive high out-migration rates and low in-migration rates, reflecting declining regions.
- Group D - Distinctive high in and out-migration rates, close to balance, reflecting high turnover in dynamic regions.

TABLE 1 CORRELATION COEFFICIENTS MATRIX FOR PER CAPITA MIGRATION RATES IN 14 REGIONS IN ISRAEL FOR SELECTED YEARS

	IM				OM				NM				INTM			
	1969	1970	1971	1974	1969	1970	1971	1974	1969	1970	1971	1974	1969	1970	1971	1974
IM	1.000	1.000	1.000	1.000	0.307	0.272	0.483	-0.101	0.653	0.576	0.604	0.665	0.599	0.587	0.707	0.309
OM					1.000	1.000	1.000	1.000	-0.521	-0.630	-0.406	-0.811	-0.219	-0.379	0.101	0.101
NM									1.000	1.000	1.000	1.000	0.712	0.795	0.646	0.108
INTM													1.000	1.000	1.000	1.000

IM - Gross in-migration per-capita rate  
 OM - Gross out-migration per-capita rate  
 NM - Net migration per-capita rate  
 INTM- Internal migration per-capita rate

Based on: Central Bureau of Statistics, STATISTICAL ABSTRACTS, Jerusalem, 1971-1972-1973-1975

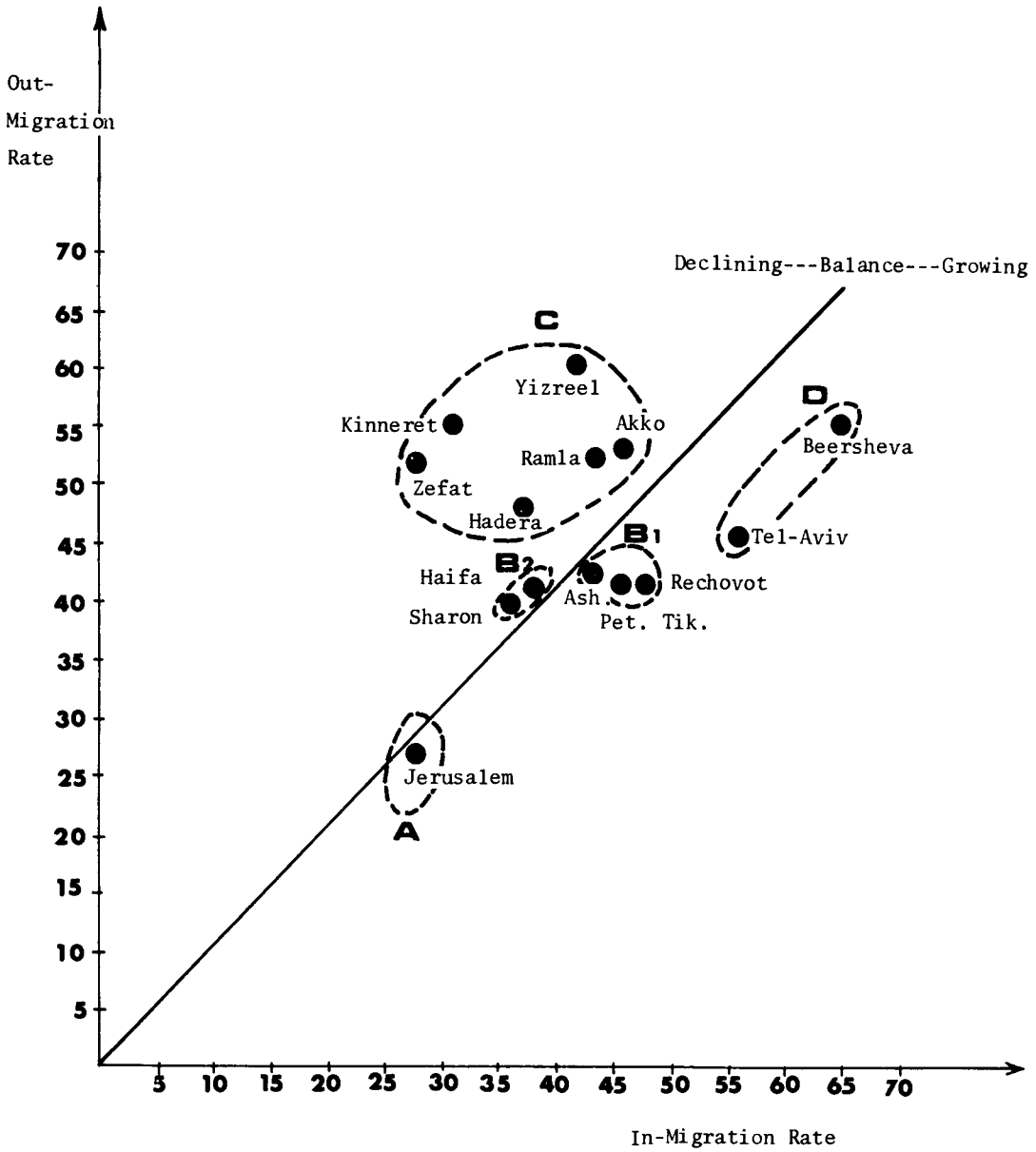


FIG. 2 - Relationship Between Out-Migration and In-Migration  
Per-Capita Rates - 1969

Source : Central Bureau of Statistics, Statistical Abstract- 1971.  
(See text for explanations)



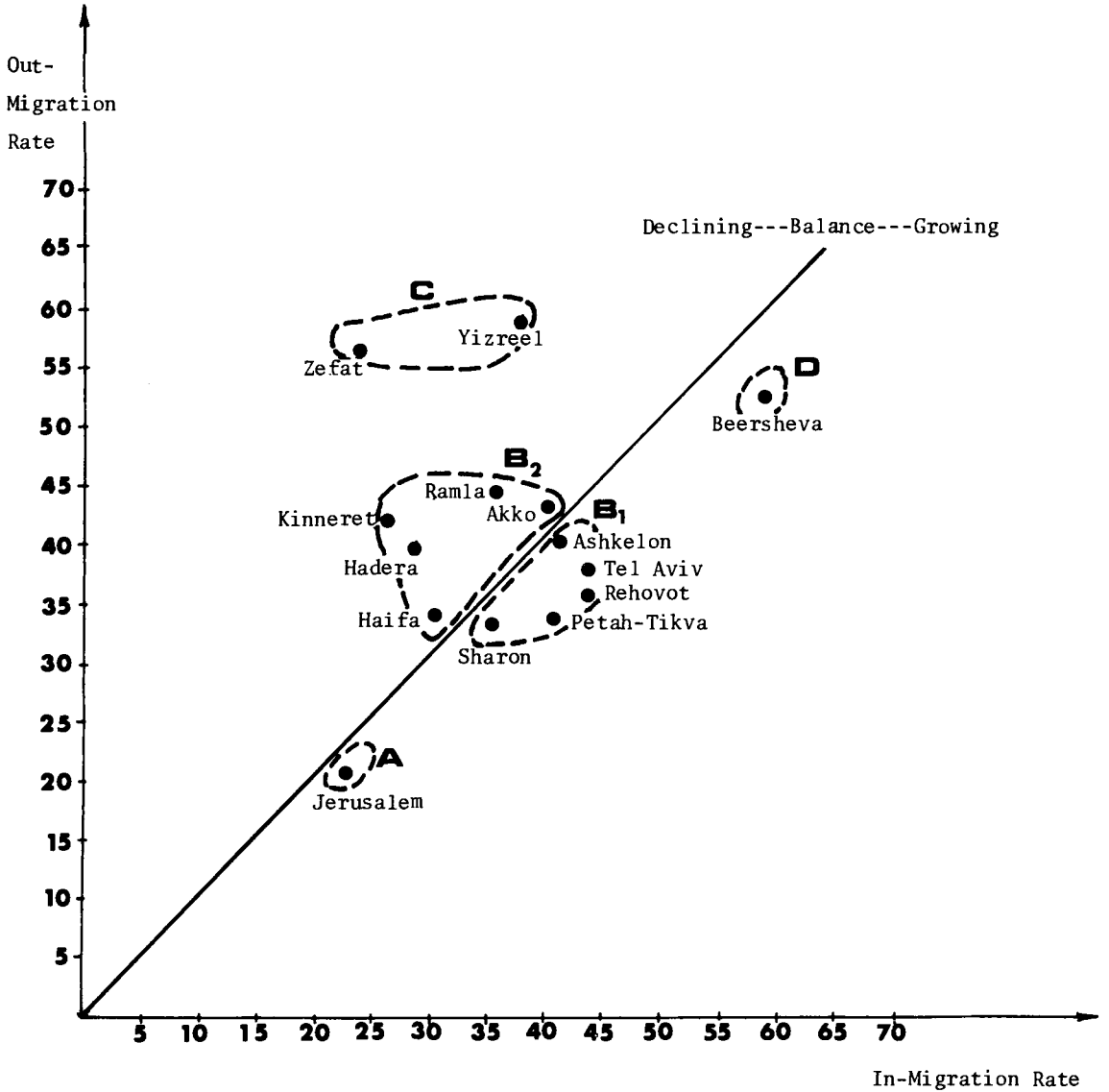


FIG. 3 - Relationship Between Out-Migration and In-Migration Per-Capita Rates - 1970

Source : Central Bureau of Statistics, Sa

Source : Central Bureau of Statistics, Statistical Abstract - 1972.  
(See text for explanations)

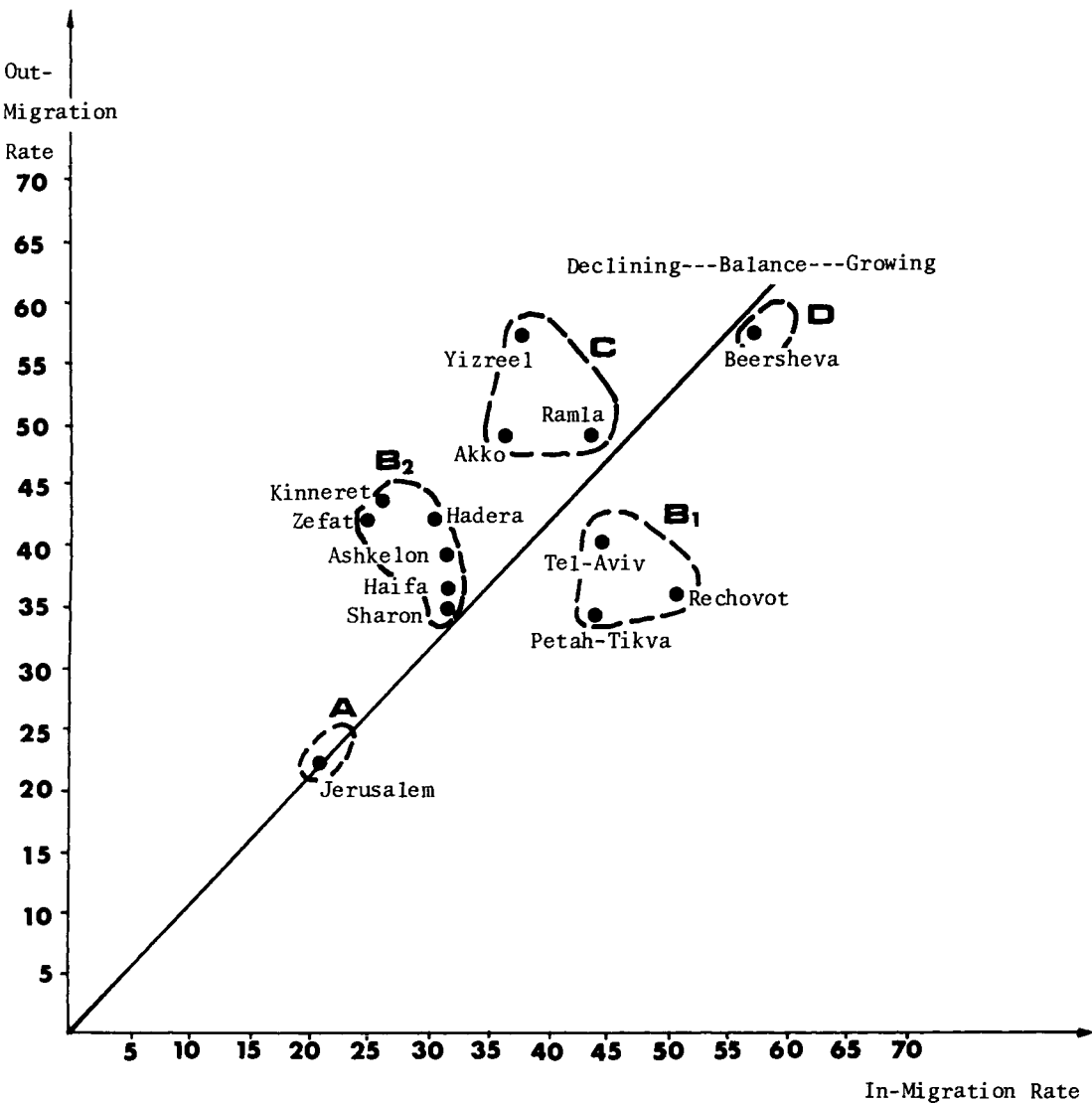


FIG. 4 - Relationship Between Out-Migration and In-Migration Per-Capita Rates - 1971

Source : Central Bureau of Statistics, Statistical Abstract - 1973.  
(See text for explanations)

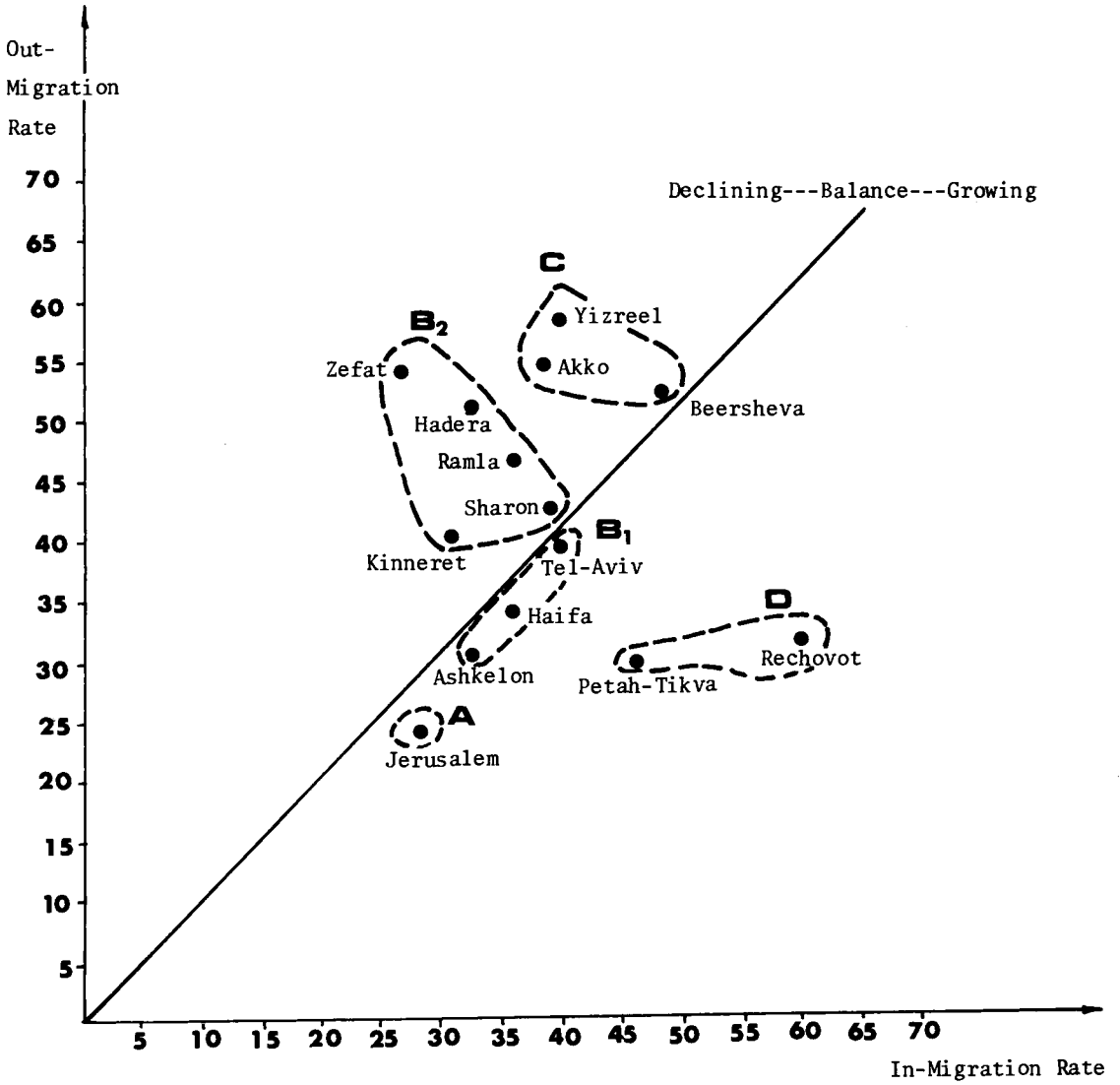


FIG. 5 - Relationship Between Out-Migration and In-Migration Per-Capita Rates - 1974

Source : Central Bureau of Statistics, Statistical Abstract - 1975.  
(See text for explanations)

It is clearly seen that 1974 is not characteristic, as mentioned beforehand, especially for out-migration patterns in relation to the trends of previous years. Therefore, conclusions in relation to this specific year should be drawn with care.

The Jerusalem region alone comprises Group A for all years, showing relative stability and limited economic developments.

Obvious growing regions do not always show high rates for both in and out-migration, as mentioned previously. Only the Beersheva region is in Group D in the years shown (except 1974), with high in and out rates, while other growing regions such as Rechovot, Petah-Tikva and Tel-Aviv, do not show high out-migration rates.

The distinctive declining regions in the north of the country - Zefat, Yizreel, Akko and Hadera are in Group C or B<sub>2</sub> for all of the periods described. These regions are at the focus of national and regional development policies of high priority in order to strengthen the Galilee area economically and socially. It is clear from the data presented that the migrants from Groups C and B<sub>2</sub> are attracted to B<sub>1</sub> and D cities, which are along the Coastal Plain and the Tel Aviv vicinity, and are becoming congested, presenting a growing environmental problem. The Tel Aviv region itself, together with the Ashkelon region are declining in their rate of growth, while the Rechovot and Petah-Tikva regions are absorbing most of the out-migrants from the northern declining regions.

In order to strengthen the findings presented, another measure was used to relate patterns of attraction of in and out-migrants to mobility of population groups and economic conditions that prevail in each region. This measure is the internal migration occurring within each region, migrants moving from one town to another in the same region, a measure used in Masser (1976). The relationships between the in and out-migration rates and internal migration rates (per-capita) for the same regions and years analyzed previously are also shown in Table 1. The same previous behaviour is depicted, relating in and out-migration rates to a certain parameter (internal migration) - showing a positive correlation for in-migration and internal migration and a negative or no correlation between out-migration and the same parameter. High internal rates may reflect on positive labour mobility and mainly employment opportunities, therefore attracting in-migrants. On the other hand, internal migration does not encourage out-migration to different regions. This result is consistent with the previous assumption that factors encouraging net migration do not affect or even deter out-migrants. This can be utilized as proof of the "push-pull" theory, indicating that high in-migration rates as a response to economic attracting powers coincide with low out-migration from these same regions.

The results shown in this section pose the necessity for a different framework for dealing with out-migration in a developing system, than that of a developed-industrialized system such as England. Out-migrants from declining areas are especially sensitive to economic conditions in their region concerning employment and housing, as well as to differential attracting factors of destination regions. There is also proof to some limited extent of moving out of economic strength from growing regions and therefore, the "push-pull" concept is applicable, but must be modified, perhaps using a measure of "assymetry" as suggested by Renshaw (1977).

In order to test this reasoning, various calculations were conducted using the in and out-migration rates. The results are presented in Table 2. The first relationship is adjusted for the data in Figs. 2-5, excluding region groups A and D, as these regions have either distinctive low in and out-migration rates or dis-

TABLE 2 CORRELATION BETWEEN IN AND OUT-MIGRATION PER-CAPITA RATES FOR ALL YEARS - (ADJUSTED DATA)

	I			II			III			IV			V		
	OUT-MIGRATION			OUT-MIGRATION			OUT-MIGRATION			OUT-MIGRATION			OUT-MIGRATION		
IN-MIGRATION	1969	1970	1971 1974	1969	1970	1971 1974	1969	1970	1971 1974	1969	1970	1971 1974	1969	1970	1971 1974
	0.507	0.272	0.485 -0.101	-0.251	-0.327	-0.038 -0.311	-0.284	-0.392	-0.048 -0.475	-0.368	-0.417	-0.175 -0.626	0.949	0.960	0.943 0.994

- I - Unadjusted national data (See Table 1)
- II - Adjusted, excluding A and D groups (See Figs. 2-5)
- III- Adjusted, excluding 4 largest city regions (See Text)
- IV - Adjusted, excluding 4 largest city regions and two additional stable regions (See Text)
- V - Adjusted, using data excluded in Column IV (See Text)

Source : Table 1 and Figs 2-5

tinctive high in and out-migration rates. This suggests a positive relationship between the two rates, while the other regions are either declining regions, having high out-migration and low in-migration rates, or other forms, suggesting inverse relationship between these two rates.

The results shown in Table 2 show the effect the A and D groups have on the correlation coefficients. An inverse relationship is now suggested for all years, its magnitude depending upon the strength of the unadjusted relationship between the in and out-migration rates.

Further adjustments to the correlation data are also presented in Table 2. The data for all four large city regions is excluded in order to focus on migration relationships between development towns and attracting regions. A criteria of population minimum was used for exclusion - over 180,000 people in a city region in 1969, 189,000 in 1970, 200,000 in 1971 and 230,000 in 1974. This excluded Jerusalem, Tel Aviv, Haifa and Beer-Sheva regions for all years, averaging over 55% of the population in the country in each respective year. We find small increases in negative coefficients for all years, especially 1974.

The last adjustment excluded the Ashkelon and Sharon regions in addition to the four large city regions, as the former reflect stable regions with average turnover and are assumed to contribute to the positive relationship of the two migration rates. As shown in Table 2, all negative relationships are strengthened for all years and tend to become quite significant.

Correlating the data for the groups that were excluded above shows us a distinct positive relationship between in and out-migration, as shown in column V of Table 2. (The data for the other groups excluded were not correlated because of the small quantity of data available.)

These findings clearly suggest that both the inverse relationship and the positive relationship between in and out-migration rates are prevalent in Israel. Large city regions and stable regions constitute the positive relationship, while most development regions and rapidly growing central regions compose the inverse relationship. The northern development regions suffer from high out and low in-migration rates, while the central regions attract high in-migration and have low-out-migration rates. Therefore, while using data for both these characteristic groups together, no distinctive relationship was found. This shows that all data on relating migration rates should be used with caution, as the underlying relationships may be present, but at a different level than that originally estimated.

In view of the conditions of Israel's development areas, clear emphasis should be put on the role of economic and social factors in affecting out-migration, contrary to the Lowry theory. The attracting powers of these towns have been established in a limited form through incentives to move to and work in development towns, but the retaining powers seem to be weak. Unemployment, low diversification of jobs, insufficient services and cultural facilities are some of the components affecting out-migration, directed towards the established towns in the central regions and outskirts of Tel-Aviv. These same components serve as negative prospects of moving to these regions, in spite of incentives, thereby strengthening the "push" factors of development areas and the "pull" factors of central cities.

A stronger implication is suggested, mainly that economic incentives in development regions aid out-migrants by raising the financial opportunity to change residential location after a period of time, in addition to serving as economic attracting powers. This is only the case when basic social, housing and infrastructure conditions are not maintained at the necessary level in these regions, as well as

insufficient employment opportunities, low diversification and unsuitable wage rates that prevail.

Before stating the possible implications of the previous sections to national settlement policies, it is necessary to give a short overview of the research related to outlining additional effects on the migration decision process.

#### ADDITIONAL PERSPECTIVES IN EXPLAINING MIGRATION PATTERNS

The data presented in the previous section show that although much can be learned from observing in and out-migration rates, additional factors must be used to give an explanation of interregional migration patterns.

Rogers (1976) implies that the strong correlation found by Cordey-Hayes (1974, 1975) and found to be much smaller in Section 3 of this paper, does not invalidate the "push-pull" standard economic theory of migration. It does not tell us about responses of in-migration and out-migration to differential economic and social conditions, and a better theory of migration behaviour would facilitate the interpretation of the results.

In order to view some of the complexities involved and somewhat hidden by analyzing in and out-migration rates relationships alone, some of the factors influencing migration will be summarized. The literature on the subject is extensive and only the main features are presented, following Alperovich et al (1975) and other recent developments:

1. Economic Factors - income per-capita or wage rates, unemployment or rate of change of employment, housing opportunities and size of population (for origin or destination). This leads to the recent controversy whether differential rates of migration are induced by differential rates of growth or vice-versa, termed the "chicken-egg" issue (Mazek and Chang, 1975; Muth, 1975).
2. Social and Perception Variables - age and educational level (Schwarz, 1976; Schiffel and Goldstone, 1976), town infrastructure, education and health services, ethnic composition of population (Berler, 1970; Kirshenbaum and Comay, 1973). Distance, as expressed by the various gravity models, used in many spatial interaction models, is described in detail in Wilson (1974) and used recently by Masser (1976). Additional variables mentioned in this group are political considerations (Barnum, 1976). The "beaten-path" concept and "chronic movers" (Renshaw, 1972) indicate some of the psychological complexities related to migration decisions, involving elements of individual mobility and propensity to migrate due to non-economic factors.
3. Environmental Variables - temperature (Renshaw, 1970, Alperovich, et al, 1975), air pollution (Cebula and Vedder, 1973).

Most of these studies use methods of regression analysis, as described in detail in Willis (1975) and its pitfalls clearly cited in Rogers (1976).

Recent developments (Renshaw, 1972; Gleave and Cordey-Hayes, 1974) tend to view the migration process as a learning process, where many job vacancies and low unemployment increase the propensity to migrate, through a constant low-risk labour market turnover process. Differentiation has also been stipulated regarding short-term and long-term migration decisions (Renshaw, 1974; Hyman and Gleave, 1976).

### POLICY IMPLICATIONS

Better comprehension of the migration process is an essential component of formulating national settlement studies. The need for such national plans is stressed in Cordey-Hayes (1975) and Rogers (1976) and described conceptually in West et al (1976).

Planning models, as proposed by Stern (1974), for example, are useful in projecting the attainment of population goals, but lagged effects of migration (Renshaw, 1974; Mackinnon, 1975) are seldom accounted for in detail.

The empirical evidence has suggested the importance of the response of migration to economic factors. In order to control the relative growth of regions a government may wish to influence these factors through a system of incentives (Kedem, 1976). In a dynamic, developing system such as Israel, the government is constantly trying to influence population dispersal by using incentives for industry, services and individuals (Gradus and Krakover, 1975). Population dispersal and a balanced settlement policy are essential in terms of defense, national economy and industrial productivity. The incentives offered are aimed not only at attracting population to development areas, but towards retaining the existing population levels.

The two main questions facing government planners are:

1. How to divide a budget into various types of incentives and economic activity, and
2. How to estimate the effect of each type on migration patterns.

If these questions can be answered, it may then be possible to control the relative growth of certain regions in the desired direction.

The implications made previously at the end of Section 3 suggest a need for a decrease in the importance of long-term incentives in development areas, such as tax rebates or housing loans at subsidized rates. Personal incentives should increase the attractiveness of a region, attracting in-migrants, but should not serve as a tool for allowing short-term residential decisions, resulting in out-migration after sufficient financial savings.

A conceptual single region incentive induced migration model is presented to explain some of these relationships and is shown in Figure 6. It is assumed that the annual government cost (TC) designated for inducing economic activity and attracting population into any development region are divided into three main components:

1.  $I_1$  - Annual government costs due to induced economic activity: generating industrial and service employment, constructing housing projects, building up the region's health and education system, and strengthening the local infrastructure.
2.  $I_2$  - Annual government costs due to incentives offered to migrants who move into the region in order to minimize their cost of residential change: payment of moving costs, conditional loans and grants for housing acquisition or building.



3.  $I_3$  - Annual government costs due to incentives aimed at longer term retaining decisions of the population already residing in the region: tax rebates, subsidized rates of loan returns and rental payments.

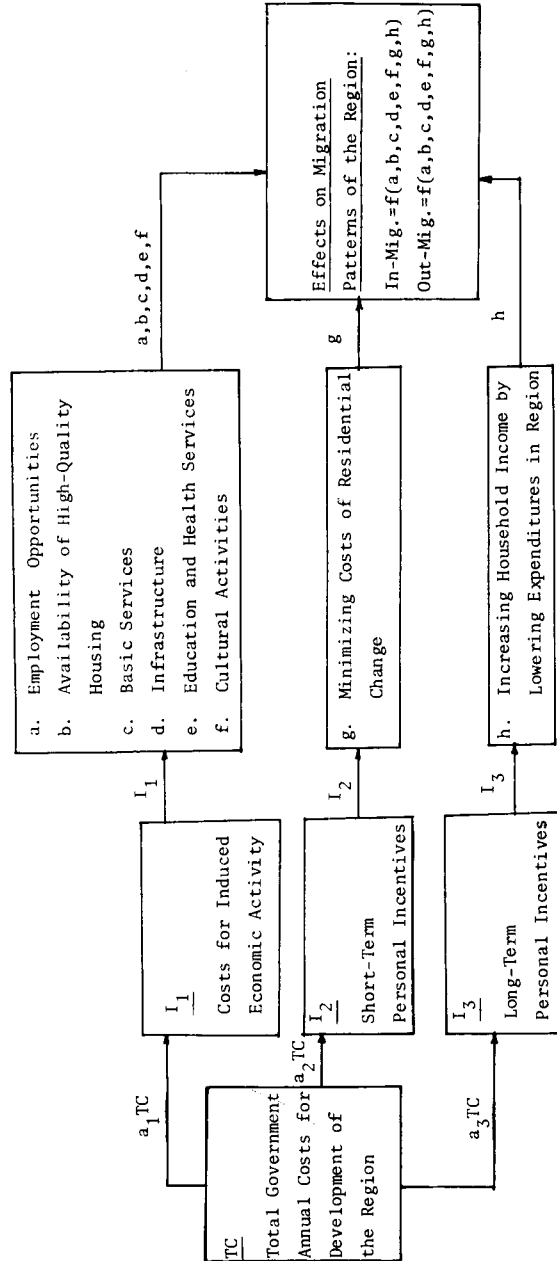


FIG. 6 - CONCEPTUAL SINGLE REGION INCENTIVE INDUCED MIGRATION MODEL  
(See text for explanations)

These costs can be expressed in the following equation:

$$I_k = a_k TC$$

$$\sum_k a_k = 1$$

The proportion of the annual government costs directed to each group of costs or incentives is referred to as  $a_k$ . In the case described previously:

$$TC = a_1 TC + a_2 TC + a_3 TC$$

$$\text{or: } TC = I_1 + I_2 + I_3$$

By controlling the  $a_k$ 's, the migration in and out of the region may be regulated, as suggested by the migration equation in Fig. 6. The exact migration functions must be evaluated using empirical data and research is being conducted at present in this direction for the Israeli case. There are several assumptions that are proposed and will be analyzed analytically. In-migration is assumed to be attracted by employment opportunities, housing quality and other attracting economic characteristics of the region. Out-migration is assumed to be affected by the continuous availability of employment and its diversification, quality of education and health services, probably to a greater extent than a small increase in income.

Therefore, it is suggested that part of the  $I_3$  incentives be directed to  $I_1$  costs, through a periodic appraisal of the  $a_k$  proportions, assuming a pre-specified TC- annual government cost constraint for the region. Without continued investments and induced economic activity, the personal income incentives will enable potential out-migrants to reach the financial level of moving out of the region. Long-term negative migration balance will require additional funds not planned for in order to revive the region, after having invested considerable amounts until then (as in the case of the Galilee region in Israel in recent years.)

The effect of government incentives on the growth of regions has been suggested previously (Kedem, 1976), but research is continued to validate the above model empirically. It should be remembered that expenditures on loan and grant incentives ( $I_2$ ) are easily accounted for in national budgets. Subsidized tax, loan and rental payment rates ( $I_3$  incentives) are much more difficult to account for economically, as they basically constitute income decreases and not direct expenditures. This causes the exact financial evaluation of these incentives to be a difficult, and at times impossible, task (see Surrey, 1970). The time-lagged effects of some of the factors described in the model are not dealt with in this paper, but are assumed to be of some importance when dealing with national models.

In establishing national settlement policies, this proposed single region model can serve, with little alternations, as a sub-model of a multi-regional system model. In employing in and out migration equations for a multi-regional system, the total net migration balance for all regions must equal zero. Therefore, a technique for minimizing the error terms of each pair of in and out-migration equations for each single region must be incorporated, especially when using the model as a planning model.

The framework presented is based on the "push-pull" concept, consistent with

some of the findings presented earlier in this paper, and implying that in-migration is attracted by economic factors while out-migration is encouraged by poor economic factors.

The various mobility trends of population groups and impacts of previous migration patterns are not elaborated on in this context. In Israel, the presence of strong periodic immigration waves from abroad and their regional dispersal, combined with yearly emigration patterns out of the country, probably have effects on the migration process. This complicates the analysis of the national system and requires further research, as very little work has been done on this subject up to the present and should be consistent with national settlement goals.

### CONCLUSIONS

This paper has dealt with some of the aspects of migration patterns, using in and out-migration rates rather than the interregional migration flow matrix. Using empirical data for selected years in Israel, no positive correlation was established between in and out per-capita migration rates. The proposed explanation for this finding is the joint effect of both inverse (push-pull) relationships, mainly in development areas, and positive direct relationships, in large cities and stable regions, between in and out-migration rates. This was presented by adjusting the correlation calculations and finding a group of regions that contribute to the inverse relationship, while others contribute to the positive correlation. This can serve as a possible explanation of the different coefficients found in different national frameworks while correlating in and out-migration rates.

Cluster analysis of the data has shown possible groupings of the regions according to their migration rates. Only one region was found to have both high in and out-migration rates for all the periods presented, while all other regions are grouped into other characteristic clusters.

In and out-migration are assumed to react differently to various economic conditions in a specific region and this was shown in the conceptual model presented, though no data analysis is available to support this assumption. The allocation of government funds to various industrial and personal incentive schemes, in addition to induced economic activity, requires constant evaluation as to their contribution to regional growth. The factors affecting migration are a weak link in many planning models, mainly due to the problems of quantifying some of the parameters that influence residential change.

The framework presented has tried to emphasize the need for constant government economic activity in development regions, especially in assistance in the creation of employment opportunities. This should even come at the expense of giving certain personal income incentives to individuals.

The fact that some of the empirical results presented for the case of Israel were not consistent with results for other countries, is proof of the different conditions prevailing in each national system. These conditions and their perception by the individuals, in addition to basic mobility factors, are essential in the explanation of in and out-migration patterns in every national system.

FOOTNOTE

1. The term gross migration is used to describe either in or out-migration. Net-migration is the difference between gross in and gross out-migration.

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#### APPENDIX

##### The City Regions in Israel Used in Migration Data Analysis

###### Jerusalem District:

1. Jerusalem

###### Northern District:

2. Zefat
3. Kinneret
4. Yizreel
5. Akko

###### Haifa District:

6. Haifa
7. Hadera

###### Central District

8. Sharon
9. Petah-Tikva

10. Ramla

11. Rechovot

Tel Aviv District:

12. Tel Aviv

Southern District:

13. Ashkelon

14. Beersheva.

Source: See Figures 2-5 in text.

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