

ANALYSIS OF HOUSING-RELATED MOVES  
TRADE-OFFS BETWEEN RESIDENTIAL MOBILITY  
AND HOUSING FLEXIBILITY

by

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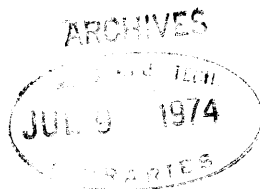
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Abstract

Two elements of the housing market are the focus of this paper: residential mobility and housing flexibility. Residential mobility occurs when the occupant of a dwelling vacates it to establish residence in another. By moving, the consumer adapts his housing to his changing needs. Housing flexibility--in contrast--occurs when the shelter space itself can be altered so as to adjust it to the changing needs of its occupant. Therefore, residential mobility and housing flexibility both can be seen as ways to realize demand changes in housing.

The purpose of this thesis is to link these two modes by establishing circumstances and need constellations for which trade-offs might be identified between residential mobility and housing flexibility, allowing substitution of the former by the latter.

It will be argued that for a substantial number of people the need arises to have their changing housing needs be

accomodated through housing flexibility rather than through the exercise of mobility, be that in order for them to remain in a familiar residential area--if they wish so-- or be that because of the severe limitations placed upon their choices in the housing market. It is recognized that greater flexibility/adaptability of housing--on the one hand--would allow for a far better supply-demand match in light of long-range changes over the life time of buildings and--on the other hand--would provide alternative ways to bring housing in line with the short-range changes that are associated with life-cycle changes of its occupants. In connection with supply and demand, the concept of variety will be discussed; and in connection with adaptability of environment, the issue of user-involvement and control will be raised.

The method of inquiry used in this study is primarily a careful review and analysis of case studies pertaining to short-distance migration, housing complaints, reasons to move and alterations of the environment. By way of descriptive analysis rather than quantification, inferences from the overlap of the various data sources will be applied towards an outline of a model of housing adaptability in Chapter IV.

Thesis Supervisor: Julian Beinart

Title: Professor of Architecture

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## Chapter I

### INTRODUCTION/BACKGROUND/PROBLEM

The three sections of this chapter contain the outline of those elements which are seen to be instrumental in the discussion of the problem. Section A will put the questions which will be raised into a personal context, and by so doing will offer a collection of observations and experiences which comprise the rough framework for this study. Section B will discuss those three topics which are seen to be most closely connected with the problem: Environmental adaptability as a general concept; the discrepancy between housing as it is produced and housing as it is perceived and used; and the allocational properties of supply and demand under the condition of homogeneity, variety and housing flexibility. Finally, in Section C, the elements will be related to each other from a methodological point of view, and the problem and relevant questions will be formulated.

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The footnotes for this chapter can be found on pages 130-134

A: Personal Interest

To guard against the notion that it is the intention of this thesis to solve once more the housing question-- this time by doing away with residential mobility-- and to put the observations that follow into a personal context, it might be interesting to list some of the experiences which are behind components discussed in this paper. At the time those observations and experiences were made, they remained often unconnected, or fell into an overall matrix which differs markedly from the discussion which follows. Consequently, this paper also represents one of the transient stages in the digestion of these experiences.

- (1) In the course of a modest urban renewal effort which was carried out in Berlin-Kreuzberg/West Germany during the late 60's(1), I became involved in two studies concerning the reaction to this effort by the residents. One study revolved around the migratory behavior of those lower middle class and working class residents vis a vis the ongoing renewal effort, the other concerned itself with efforts by the residents to double up and alter their living arrangements in order to help minimize

inevitable dislocation of residents. Neither of these investigations really got off the ground, and their impact on the events was minimal. But two observations might be worthwhile mentioning: a) residents avoided at all cost to have to leave the area--although more "attractive" housing had been offered to them--and tried to solve their problems through intra-area migration; and b) alterations and rearrangements--in nature functional and semantic--were quite common and seemed to express the desire to accommodate within the existing housing stock. Also, it was often mentioned that there really was no other place for them to go.

- (2) In connection with the above mentioned involvement, the discovery was made that the predominant tenement-type of housing (4 and 5 story walk-ups built around the street pattern in blocks) was surprisingly adaptable to various needs and well suited to conversion. The floor plan layout was characterized by an additive sequence of rooms along an internal spine-like corridor, the living quarters facing the street, the service quarters facing a back court. The rooms were roughly of equal size, their additive



character preventing complex interrelations. Additionally, the provision of servants' quarters resulted in two apartments in one, with two separate entrances--the staircase at the rear for servants and delivery, the main staircase in the front for the bourgeoisie family. This layout lent itself to separation of the two apartment sections, allowed subdivision at any one point along the main corridor, and--because of the relatively equal size and unspecified location of the main rooms--provided great variety as to the use of these rooms.

- (3) During the late 60's, in West Berlin, a large scale housing project for roughly 60,000 residents was planned and built. MAERKISCHES VIERTEL as it came to be named, was a typical effort in mass housing of the second generation, financed with government subsidies for middle and low income families. What distinguished it from the first generation of mass housing after WWII was the attempt at greater variety in site planning, dwelling types, rent variation, and an ambitious aesthetic attempt at landscaping and "stone scaping" the project on a gigantic scale. It is not my intention here to re-tell the

entire story of this effort with all its intricacies, except one observation. Since this project--like all mass housing--had been planned for an indeterminate market, deriving its programming base from what J. Habraken calls brick-and-mortar statistics on prospective residents, the characteristics and needs of the residents moving in were at gross variance with the physical environment which had been programmed in their absence. They settled, nevertheless, since the housing shortage for these economic groups was severe and the housing provided was far more attractive than the one they often came from. This raises two points: a) this housing is not only un-adaptive to need-changes of its residents, but is--without built-in adaptability--not even suited for them upon occupation; and b) because of its fixed and homogenous character, utilization of the project (and, more specifically, of the housing in it) during its life time can only be accomplished by synchronized mobility of the greater part of its population.

- (4) My thesis research in Germany focused on an approach to model and quantify adaptability potentials of

various housing and dwelling types.(2) Its main rationale was the hypothesis that only a quantitative statement on the performance of a building with respect to its flexibility would allow comparison between needs and their possible accomodation as well as comparison between buildings themselves. Although this approach still seems rather interesting, it opened up more questions than it answered. It raises questions about the specific needs which can be met by specific modes of adaptability; about the quantitative and qualitative importance of those reasons to move which can be met by strategies other than to move; and last but not least about the phenomenological paradox that anticipation of demand changes and their translation into categories of adaptability might cause as fixed a result as the traditional modelling of space according to needs.

- (5) For more than one and one half years I lived in the Jeffrey's Point neighborhood of East Boston. It was the first time that I lived in what is called an ethnic neighborhood. This position of a participant-observer made it easy to realize some concrete characteristics: a strong neighborhood

feeling reinforced by outside threats like the airport issue and the deterioration of the waterfront; lively children who were aware of their territory in almost gang-like fashion; strong family and friendship ties throughout the area; the relative frequency of three-generation households, that is the incorporation of the elderly into the family despite the limitation posed by the housing stock; the role of a laundry facility as meeting place with TV, magazines, free coffee and lots of talk. And most pertinent: a great devotion to the house which expressed itself in repairs, decoration, repainting, remodelling and adding, in which owners and tenants often shared ideas, execution and costs-- a seemingly "non-market" situation in which between owner and tenant pure economic benefits were traded off for social benefits like relationship, trust, responsibility and a feeling of safety.

### Summary

The purpose of this section was twofold:

First, to indicate the more personal (historical) context in which the topics dealt with are of interest;

Second, to introduce from personal experience and observa-

tion some of the elements and questions which are thought to be involved in this inquiry. These elements were introduced in a chronological rather than systematic fashion. They are:

- The desire to stay in a neighborhood and to solve housing related changes of demand through intra-area migration or through modest attempts at adapting the environment;
- The recognition that for some people the choice as to housing is limited;
- An indication that there exist spatially and typologically defined sub-markets which either cause or reinforce the limitations;
- The observation that certain characteristics of dwellings like additive room layout, separation between internal communication (hallways) and rooms, relative loose fit between function and room (room size), relative locational neutrality between rooms, more than one entrance to the unit, render possible some adaptability even in fixed-built structures;
- The distinction between short-range adaptability (resident's changes of housing needs over time) and long-range adaptability (change in the overall composition of demand over the life-time of buildings; possible extension of the useful life time);
- Adaptability of housing and its relation to planning and building for an indeterminate market (large scale housing);
- The importance of demand and demand changes behind reasons to move and their relationship to the possible performance of adaptability in housing;
- The discovery of "non-market" situations, or non-market conforming behavior in which trade-offs occur between economic benefits and benefits of well-being.

B: The Problem Space

The purpose of this section is to discuss on a level not related to specific data some issues which are seen to have bearing on or are seen to be influenced by residential mobility and housing adaptability and their relationship with each other. The first of these issues concerns what could be called a morphology of adaptability. Such a discussion might prove helpful in that it might reduce the ambiguity contained in the concepts of flexibility/adaptability. Furthermore, it might succeed in re-discovering from a different perspective some of the elements put forward in the previous section, and in expanding on them. The second section will revolve around the problem of defining where what is called "housing" begins and ends and will make an attempt to look into some economic, functional and symbolic reasons for the obvious confusion. The third point relates to the relationship between supply and demand and how mobility, adaptability and variety operate to make them meet. This will be done by modelling very simple situations of housing needs and shelter-space and by discussing the allocational implications when housing needs change.

The term "problem space"(3) as used here defines the effective field of which the topic of this paper is believed to be a part. The above mentioned three issues are by no means inclusive. But they seem to me the most interesting ones, and since they will only sporadically be carried through this paper they should be dealt with at some length in this section.

B.1: Environmental Adaptability

Adaptability can be thought of in terms other than the environment. Communication, techniques, management, administrative regulations, for example, provide adaptability without necessarily affecting the physical environment. But since I am concerned here with adaptation to growth and change by moving from one environment into another--or by staying and adapting such environment to growth and change--the physical environment with a special eye on housing will be in the foreground of the discussion.

At first glance, there seems to exist a fundamental conflict between the notion of adaptability and flexibility on the one hand, and the requirement of people for stability and identification with circumstances and

places on the other hand. Kevin Lynch, in his paper on Environmental Adaptability(4) puts it this way:

If it is our objective to promote the growth or change of people and their activities, then we may not want environmental adaptability....A loose, shifting, temporary world may be ideal for meeting major changes in man's circumstances, and for allowing his development without hindrance. But, not only may it not be the most suitable for the active promotion of development..., it may simply not be a very happy place for human existence.(5)

And he concludes:

(Man seems to have) requirements for some continuity and stability in our world, for structure, coherence, and imageability. Without them, the organism breaks down....Adaptable forms are likely to be ambiguous, unclear, shifting, discontinuous. Thus, there is likely to be a conflict of basic objectives (between stability-continuity/ambiguity-shift).(6)

What is pointed out here is the basic conflict within any system (and house, blocks, neighborhoods, and towns can be viewed as examples of physical systems). The problem lies in the necessity to reconcile the properties of systems (like clarity of aspiration and form, structure, continuity) with the requirements for flexible adjustment of function and space to the constantly changing situation. And although Lynch's point seems to be well taken, the conclusion as to the irreconcilability of the



system/flexibility requirements seems to be less than convincing. It seems exactly adaptability that provides continuity and structure which is so much desired. It is exactly the potential to transform space and its utilization in accord with changing needs that renders possible a continued identification with environment and a controlled transformation of structure according to needs.

What is meant by flexibility/adaptability in this context?

Three major distinctions can be made, and each of them implies differences as to structure; distribution of elements (grain); responsiveness to change; and growth forms. Basic to all of them is an understanding of flexibility that entails change and growth. (7) What are the three categories?

- (1) There is a flexibility that operates in the present, giving the individual a maximum of choice, a great range of potential activities and habitats. A large house with numerous rooms and a city with many types of housing and living areas are examples.
- (2) A second meaning of flexibility describes that quality that allows the individual to extensively take part

in shaping his own life space. This is the step from choice to participation. A small detached house with ground around it is an example because it is entirely within the range of repair and alteration by an individual.

- (3) Then there is a concept of more general adjustability of the environment to unpredictable changes in the future. These can be short range or long range changes.

If one is concerned with housing, one strategy for the first objective may be to build a great variety of dwelling types (choice), for the second to accommodate everyone in low and relatively isolated housing (alterability)(8), and for the third one to provide a tent (multi-purpose adaptability).

All three concepts, choice, alterability and general adaptability, provide useful first approaches to a model of adaptability as discussed in Chapter IV.

The next step is to ask by what means flexibility may be achieved in a physical context.

a) Unspecialized forms

An analogy with biology might suggest that highly specialized

forms are efficient but rather inadaptable, and that simple structures are the ones that most easily can proceed in different directions of development. Accordingly, one might suspect that a simple box of a room might be more flexible than a complex design for a house. But specialization (box versus house) has two meanings. First, it means "narrowly adapted" and then it means also "organization on a more advanced level of complexity." A too narrowly adapted structure is of low flexibility. Therefore, in the above example, the box might be more adaptable than the complex house, not because the former is simple and the latter complex, but because the latter might be too narrowly adapted to the complex interrelationships of needs which are particular to its inhabitant. Therefore, structures may be complex but not too specialized. Lynch observes that:

...an environment of low differentiation, such as an area where uses are highly mixed, is often more resistant to change than otherwise. A shift at any one point necessarily brings ruin upon the adjacent uses, which may have no interest in the change. Modification becomes an all-or-nothing proposition. (9)

#### b) Concentration of structure

John Habraken, in his book on supports, and in various papers (10) makes the distinction between those spaces and

activities over which a user has sole control and those which cannot be decided upon without affecting others. He arrives at a separation of infrastructure and private space, or support and dwelling. This results in a concept comparable to zoning and concentration of structure. Translated into a building, this may mean to concentrate the structural support into a few widely-separated points, providing wide spans for future changes without upsetting the fabric of the organism. The zoned-in areas are less for the purpose of different functions than they are for combining functions and activities on the basis of their likelihood to change and on the basis of the ease with which changes can be carried out without causing major disruptions.

Thus a coarse grain (zoned areas)...has an adaptability advantage, but only as long as the changes occur within the use-classes set down. Should it happen, for example, that the future tendency is to carry on function A and B in the same structure, then their separation will prove most inflexible....(But is the grain too coarse and the boundary small in comparison with the use area)...then the system is inflexible if one use would intend to increase at the expense of the other. For if uses A should tend to grow, while uses B contract, the transition is much easier if they are interspersed, than if they can shift only at their peripheries.(||)

Therefore, where major structure is concentrated and functional areas kept apart in a coarse grain, adaptability

in an environment seems to be alleviated. If the change relates, however, to functional shifts that penetrate the boundaries, finer grain of the two functions interspersed with one another might be more advantageous.

c) Additive structure

The difference between zoning and concentration of structure on the one hand and additive structure on the other is that the former constitutes a framework within which change can occur while the latter--on the contrary--is made of fixed entities which can result in a rather unspecified total pattern. Flexibility rests with this means in the combinatory possibilities of parts without affecting other parts. Growth at the periphery of the organism does not change the structure of the center. There are two kinds of additive structures, modules and lattices. An example of the former is a set of dominoes, and example of the latter a street gridiron. With the module it is the unit itself that makes up the structure. The resulting pattern is not highly organized and can be irregular. With the lattice, it is the frame or the street pattern that amounts to a more organized and regular form in the dimensional variation of which parts must be fitted. The module itself is totally fixed. If change

is required within, it is the most inflexible of all. Therefore, the module must either be specialized in a function that is not likely to change or must be neutral in quality as to perform simple functions which are likely to persist.

d) Variety

A group whose variability is small may be best adapted to present conditions, but be wiped out by an environmental shift. Another group whose variability is extremely wide may be so poorly adapted to present conditions as to succumb immediately. (12)

The range of variety, therefore, must keep rather close to the range of demand, including cases on either side of the range to allow for minor demand shifts. Too much variety dissatisfies present needs at the expense of future demands, and also is not able to accommodate major shifts of demand in the future because of its distribution characteristics. But the concept of variety undoubtedly holds an important position for the maximization of present choice. Therefore, variety on a sufficiently small spatial scale (neighborhood, block, housing block) has an adaptability function in that it allows to accommodate changed housing needs through intra-area or even intra-house moves. This will be clarified

in section b/3 of this chapter.

Again, a coarse grain is preferable where changes are expected to occur within categories, a finer grain where they are to be expected between categories of functions or uses.

e) Overcapacity

Overcapacity is seldom thought of as a means for flexibility. But of all the means mentioned here, with the possible exception of "unspecialized form" and "variety," it is the one that has provided flexibility in pre-technological building and planning. The provision with more space than necessary for the moment or for a function assigned to this space not only allows a switch of functions, but also facilitates internal manipulation like add-in or subdivision. Low density zoning for housing developments and the Victorian house in Great Britain are pertinent examples. Overcapacity incurs costs which have to be compared against other means for providing flexibility, including moving by choice (variety).

f) Disposability

Future flexibility has often been sought after by the use of temporary facilities. If the structures have short lives, they are not long obsolete.... This is the organic answer to flexibility, par

excellence. The internal parts of organisms are continuously being torn down and rebuilt to meet changing stress. Life is willing to pay a tremendous energy price to achieve this flexibility.  
(13)

This line of reasoning has been very popular during the late 50's and early 60's when preoccupation with technological aspects of flexibility and the package-and-machine image of housing (mobile homes) were at their high while questions of user-participation in "dwelling" (14) and ecologic responsibility had not yet fully emerged as issues. The concept is striking in that it tries to combine the two un-combinables: optimization of present use and utilization (demand-match and efficiency) on the one hand, and the pace of anticipated change in synchronization with the life-time and service components of the building on the other hand. But temporary structures have a complicated economic existence: control and their timely abolishment is hardly to be guaranteed, and most of their life-time is spent in obsolescence or sub-standard conditions which are only endured because of the prevalent housing shortage and the economic reality. Or, as Lynch observes jokingly:

The last "temporary" house thrown up in London after the Great Fire of 1666 was demolished in 1936.(15)



The last step in this inquiry is to ask whether there are any particular shapes which allow--and that was the objective in discussing means of flexibility--growth and change to come about in such a way that parts that do not change or grow are interfered with as little as possible.

### Growth Forms

Six types of activity-organization can readily be formulated and can be related to their corresponding growth forms:

#### A: additive arrangement/linear growth

Assume two functions--A and B--to be placed in an additive fashion along a hallway they share. Assume further that there is space for them to grow in either direction along this hallway and that overlap in the center is incompatible with either of the uses. Under conditions of change, either growth occurs or does not occur. If it occurs, it will be linear growth. The organization of each of the uses will not be disturbed by the change-behavior of the other.

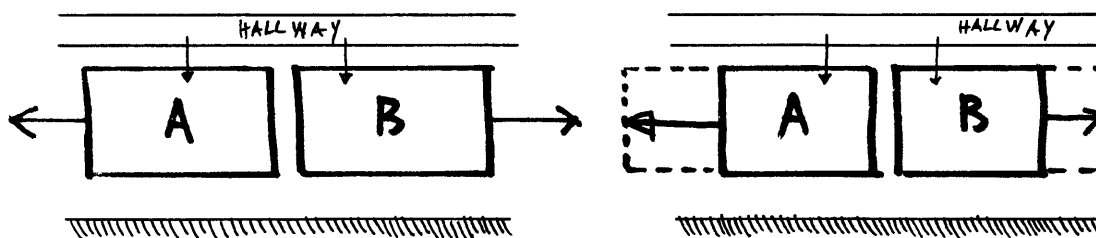


FIGURE 1a

FIGURE 1b (LINEAR CITY)

B: circular arrangement/radial growth

Assume a use/activity A and B, which are arranged circular so that activity B encloses activity A. Under conditions of change associated with growth two cases are possible. Either both activities grow at once and at about equal rate of growth pushing each other outward; then both activities can grow relatively undisturbed (which does not hold true if A grows considerably faster than B, which will lead to high stress at the boundaries or seam between A and B). Or only B grows radically outwards without affecting the structure of A.

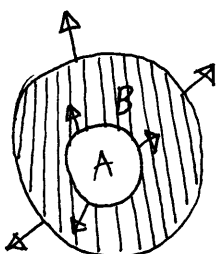


FIGURE 2a

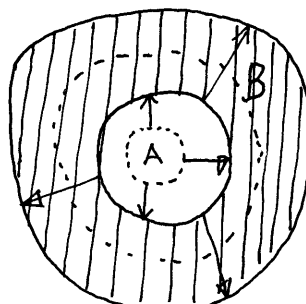


FIGURE 2b

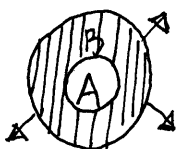


FIGURE 2c

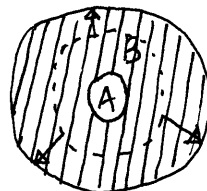


FIGURE 2 d (i.e. BURGESS)

C: arrangement in wedges/radial growth

Assume activities A and B are two among others grouped in wedges around a center of either separate or overlapping activity. In case of change associated with growth, each activity can change internally and also grow along the axis of each of the wedges without disturbing the structure of the adjacent activity. In such a case, some stress will occur along the edges of the wedges, but if there are no overriding reasons to grow circular and to penetrate into the zone of a different activity, the main direction will be outward within each wedge.

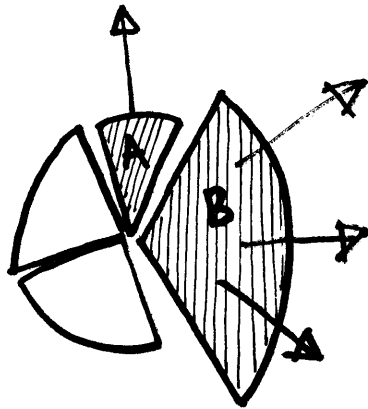


FIGURE 3a

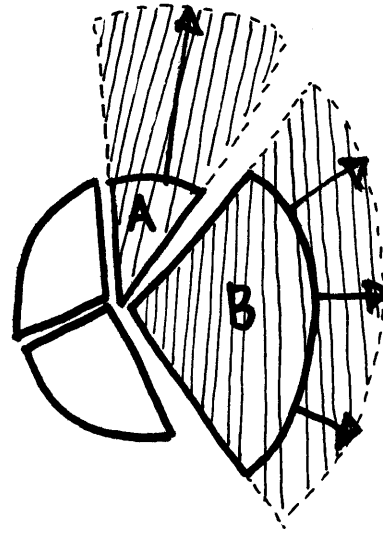


FIGURE 3b (e.g. HOYT)

D: stung-out wedges/outward and sideward growth

Assume activities A and B to be two among others to be grouped at high intensity along a center axis radiating from a center. The intensity decreases rapidly sideways from these axes. Growth can occur either additively along the center-axis, or sideways into the less intensive areas, or in both directions simultaneously.

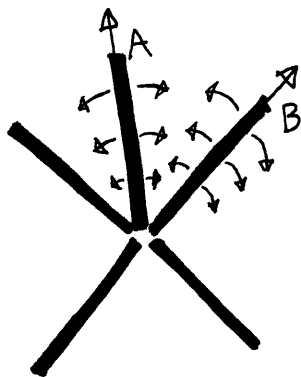


FIGURE 4a

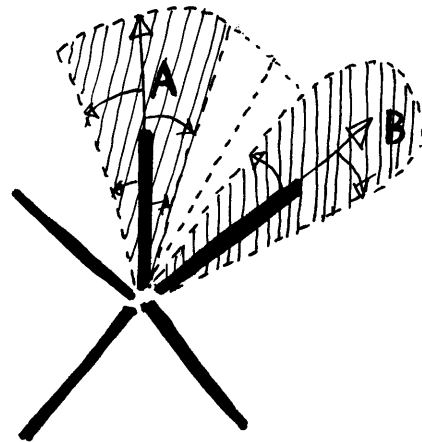


FIGURE 4b (e.g. HOYT)

E: growth in fixed boundaries/A and B separated

Assume A and B to be two activities whereby A requires large areas for the minimal unit and B small areas. Both activities are surrounded in such a way that outward growth is impossible. Assume further activity A to change and grow and activity B to decrease. In this case, severe disruption occurs at the seam between the two activities, whereby the stress is very unevenly distributed and concentrated along the interface between the two.

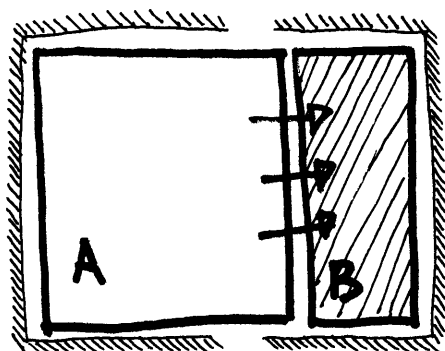


FIGURE 5a

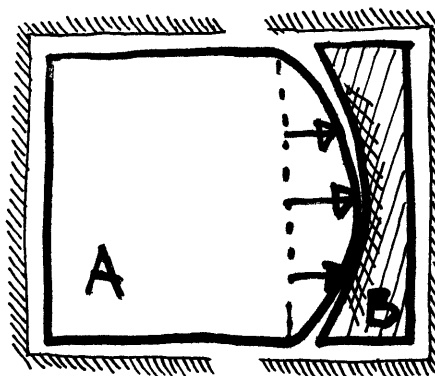


FIGURE 5b

F: growth in fixed boundaries/A and B interspersed

Assume the same constellation as above to be the case. But instead of separation, activities A and B are interspersed. Under the growth conditions of case E, the stress on activity B will be more evenly distributed and will be less than in case E.

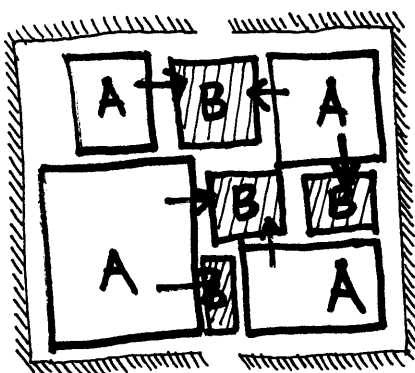


FIGURE 6a

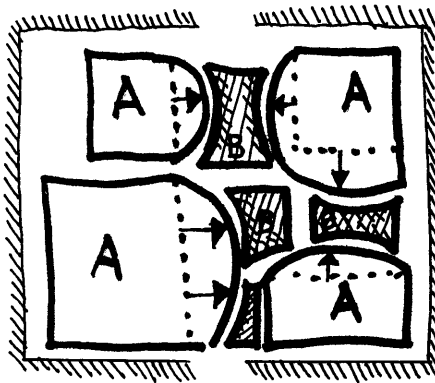


FIGURE 6b

From the above shown diagrams, one characteristic can be discerned which all growth forms have in common: they fill up over time. If positive growth (increase) and negative growth (decrease) do not roughly balance each other out, and if changes cannot be accommodated through changes within the units or areas, then growth leads quickly to a process of filling-up of the built-in overcapacities, or it leads to vastly expanded systems (case A to D).

#### Summary

This section has proceeded in three steps. First, categories or kinds of flexibility were introduced (choice; alterability-adaptability; general adaptability to unpredictable long range and short range future change). Then the means have been discussed which could bring these kinds of flexibility about (unspecialized forms; concentration of structure; additive structure; variety; overcapacity; disposibility). And finally, spatial arrangements were modeled and their growth behavior observed (Cases A to F). Each of the means performs different functions and has specific properties. Each of the growth patterns has specific spatial qualities and contains variations (not shown here) that interfere with other activities in the process of change and growth.

B.2: 'Housing' versus 'Urban Living'

...some situations allow greater profit than others. The same economic forces and the law of supply and demand create and destroy markets for building boom towns in time of war and ghost towns in time of peace...One area is distressed; another is incremented by increasing activity.(16)

...the belief that environment is a whole whose parts can be abstracted and examined in thought, but in reality exist only in toto.(17)

...how a house, despite its apparent passivity and vacillations to which it may be subject, can provide a perfect target for the projection of a wide range of feelings and faithfully reflect the image that people form of themselves at certain moments in their lives.(18)

The idea of this section is to correlate the economic reality regarding the production of housing and urban living(19) with the perception of housing by the user. The three quotes which introduce this section are metaphors for different perspectives of that which is housing. From an analysis of housing-related needs--which at the outset of this study seemed to be in the foreground for classifying reasons to move--it became apparent that the discrepancy of what is being produced and what is being perceived as housing is at the roots of any definition of housing needs. "I don't like my place anymore" might refer to numerous features of the "place" which neither are produced nor delivered together with housing as commodity. Therefore, complaints more often than not relate to components of urban living which either were already there or which were produced independently of the housing onto which those complaints

are projected.

If demand in housing can be shown to relate to components which are used and evaluated together but which are produced separately, then the difficulties with housing needs will be traceable to the split which exists between the production and the use of the environment.

Three qualifications might be helpful. First, that rent-- or the cost of housing, for that matter--are paid to obtain access to urban living (location, services, amenities), and that its quality, availability and price are mainly determined through political negotiations. Second, that housing as commodity is greatly determined by the standard of urban land on which it is built and by the kind of urban living which its location has to offer. And third, that on the market it is the exchange-value that describes its quality, whereas it is its use-value that expresses the degree of satisfaction which the user enjoys.

If demand and supply would embody the corrective mechanism they are made out to be in a free-market economy, then the volume, kind, price and distribution of the product housing would develop in a way which would bring supply increasingly closer to the demand. But the price structure, quality and allocation of urban living is by no means determined by the 'neutral market forces' which is so often referred to and of which the demand-supply relationship is said to be a part.

In fact, all major decisions which affect urban living are the outcomes of political negotiations between various group interests. Negotiations between landowners, owners of capital and wage-earners determine the allocation of surplus-value to the different sectors (economically and spatially) in which they can be invested. The amount of rent which is paid to a landowner for the access to his land is determined by political and not by market decision. With allocation of capital for the improvement of one place of urban living as compared to another, the differential rent is influenced without the owner of a particular piece of urban living contributing necessarily to this improvement. The question of equitable distribution of benefits and costs, in short the system of taxation, is decided on political grounds.

Therefore, in the production of urban living the crucial decisions result from political rather than "market" forces. The differential in the quality and price of urban living which leads to fragmentation of the housing market and which reinforces the segregation one can observe within it are caused by the differential allocation of social overhead capital to urban land. The distinction between owners and renters, and the existence of various densities, housing types, public and private services, schools and the like in coincidence with spatially and locationally definable areas throughout the urban fabric reflect this segregation and are examples of the



existence of submarkets and their restricting properties.

The house itself--in its capacity as investment on urban land--reflects the quality of the urban land on which it is built and the quality of urban living which the location has to offer to its residents. Consequently, the production of housing is part of that process that delimits variety within an area--although not necessarily the variety of the overall urban housing stock. Through the cost of land (i.e. access to urban living), through exclusive zoning practices and building regulations, the politically relevant groups of an area see to it that the conditions under which access to the urban living of this area may be obtained can not be lowered or bypassed. In this area, any measure which promises to affect the exchange-value of the commodity housing detrimentally has to be prevented at the expense of those who would like to enjoy the urban living of this area at lower cost.

Especially where ownership is involved, the exchange-value and the use-value of housing are tightly linked. Since home ownership buys a long-term access to urban living and entails financially a long-term commitment to the house, it can be speculated that the interest in the physical and social development of the area in which the house is located is very high. It also follows that dissatisfaction with housing revolves much more around the neighborhood since--on the one hand--the control over this component of urban living is

much more restricted than that over the house, and since-- on the other hand--the development of the area affects in the most direct way not only the use-value of the house for the resident but also its exchange-value. In this respect, the renter enjoys more flexibility. Since he buys access to urban living on a short-term basis, he need only be concerned with the use-value of the urban living which is part of the deal. His prime concern will be with the dwelling itself and with the maximum of control he is able to establish over it. Upon changes of his needs with respect to urban living, or upon an unsuitable change of the quality of urban living itself (i.e. decay of the neighborhood) he moves on to other housing.

If the data on reasons to move should establish that residential mobility is the process by which people bring their needs in line with a specific kind of urban living rather than with housing as a commodity, then adaptable housing would do little as alternative to residential mobility. People do not live only in houses. The area surrounding the house is an important component of the residential "life space." Which parts of the house and its surrounding belong not only to the adjacent environment but also to the effective environment(20) differs from case to case and is difficult to determine. But the specific characteristics of each effective environment determine the use-value of urban living which is available. The house and its surrounding constitute a complex entity which is seen,

experienced and evaluated together. Dissatisfaction with the latter has impact on the judgment about the former, and vice versa. In some cases, house and neighborhood are in a compensatory relationship with one another in that dissatisfaction with the one is outweighed by the satisfaction with the other. Data from the aborted pilot study on moves in East Boston seem to suggest that it is urban living which is chosen first. Within the range of suitable environs an accommodation is looked for which meets the specifications of the resident. This sequence of housing choice is supported by the structure of communication used in real estate ads as presented in Chapter II/A. This piece of "life space" which is referred to as housing reveals itself as a complex totality of experience which is produced and exchanged in bits and pieces but which is used and emotionally possessed as a whole. Merton(21) points to the emotional connotation which is attached to the term "home ownership," where the term "house ownership" would characterize the property relation perhaps more accurately. Everyday language captures the wide range of projections which a resident holds with respect to his home, and which transcend by far the functional purpose of shelter space. Or, as George Kassinbaum points out:

What we are sometimes inclined to overlook, especially when economics is such an integral part of our thinking, is that we should be concerned about something more than simply a matter of rooms and square feet and safety devices. Factors beyond our control such as early retirement, limited mobility, etc., have created a condition that, when we look at housing that we build, we are possibly

talking about one man's total environment--his world--and since the occupant of this housing will spend most of his time in that little world, we must ask that it do more than merely keep the rain out and the heat in. It must also recognize and satisfy the individual's aesthetic, emotional and psychological needs, as well as his need for shelter.(22)

Architectural space may affect the emotional well-being of people in various ways. There is a continuous reaction on the part of each individual to the enclosed spaces in which he finds himself, to such phenomena as size, shape, scale, proportions, openness, closure, light, color. Spaces which are ambiguous as to size, shape, extent or purpose may arouse feelings of insecurity. Architectural space conditions interpersonal and family relationships through the possibilities it allows for privacy, contact, quiet, circulation, etc. Architectural space conditions extra-familial contacts--whom the family meets, how they relate to the community. And last but not least, architectural space is one of the determinants of a person's status.(23)

How closely life and housing may be interwoven is documented in Boudon's study of Pessac. In answering questions concerning their feelings about and satisfaction with the houses they live in, residents linked together elements which revolve around their well-being; the status of their children; memories of the past; housing as an image; housing as tradition; housing as a functional apparatus; and housing as an investment.

### B.3: Some Demand-Supply Simulations

All architects are agreed on the need for flexibility of design. What they have to do is allow for such flexibility from the outset....If a design is able to satisfy the needs of A whilst a second design is able to satisfy the needs of both A and B, then the second design is the better, there can be no doubt about that.(24)

This section will deal with demand and supply from a different viewpoint. Their allocational rather than their economic relationship will be in the foreground. Supply will be defined as the existing housing stock, differentiated as to type, location, cost and the like. Demand will be the term for the overall matrix of needs and preferences with respect to housing. As has been shown in the previous section--and will be shown in the subsequent data sections--demand is difficult to define. The term "housing is in demand" refers clearly to the housing shortage. The mere number of housing in want is seen as housing demand. But the "housing problem" is more than a matter of numbers. And satisfaction with housing refers to more than the bare fulfillment of the need for shelter. Discussions about needs rely heavily on an objective and explicit hierarchy of needs.

Building codes and regulations are seen to secure at least a fulfillment of those needs which--if not fulfilled--would pose a threat to survival and well-being. The definition of "habitability" of an environment is based on this hierarchy of needs(25) and constitutes a case in point.

Since the modern movement in architecture, needs have been very much in the foreground of concern and research. The idea behind this concern with needs was twofold: first, to arrive at a differentiated catalogue of requirements for "being housed" which would allow translation into spatial arrangements most efficiently tailored to meet these requirements, and second, to learn something about a client who concretely was indeterminate but who could be made determinate through statistical (behavioral) generalizations.

The observation, however, that an existing supply of housing does not meet the demand seems to imply as an objective for their relationship, that they ought to match. Therefore, a discussion about supply and demand seems to make sense only if their relationship is taken as a measure of the degree of satisfaction of housing needs or--more abstractly--as a measure of the satisfaction

with housing.

Housing is demanded by concrete people under concrete circumstances and in a variety which reflects the needs, aspirations and preferences of the beholder as well as his assessment of the probabilities to have this demand fulfilled. This qualification is necessary and helpful because, firstly, it refers to the observation that even dreams are more often than not only modest projections of reality (the possible); and secondly, that it delimits variety.

If one abstracts--for the purpose of modelling--from the real situation of supply and demand so that demand entails one need (i.e. a black house) and supply entails one property (i.e. specific color), then the allocational relationship between supply and demand--under various conditions--can be simulated on a very simple level. From this point of view, then, the relationship between supply and demand is seen as their allocational properties with respect to mis-match or match under varying "market" conditions.

The following elements will have to be defined:

- (1) Market: The market here is the sub-market available

to a specific resident. All houses in this sub-market have all the properties desired by the resident except the one property the resident is looking for. This one property the house may or may not have. The market is differentiated as to distance, which includes the house/dwelling; the neighborhood; the city;

- (2) Resident: The resident is a person who holds a matrix of demand which is called a. This demand can be satisfied in a house/dwelling of the type A. The demand of this resident can remain the same or change. For the purposes of this simulation, it is assumed that the demand of the resident changes in all cases from a to b.
- (3) The house: The resident lives in a house of type A. Since the resident has a demand a, this means that his housing needs are presently satisfied.

### Conditions

Two conditions are observed. In the first, all housing is non-flexible. This means that housing of type A can only satisfy a demand a and housing of type B only a demand b. In the second, all housing is flexible. The flexibility assumed is a limited one. This means that a house of



type A cannot be adapted to type B but only to B'. B' can accommodate a demand b, although not completely. But the frustration of a demand b in a house of the type B' is much less than would be in a house of type A.

### Subconditions

Each of the two main conditions above will be observed under three sub-conditions, which define the composition of the available market:

- (1) Homogeneity: Since the model contains only two demand classifications (a and b) and house types (A and B) homogeneity of the market is seen from the perspective of the only resident (who is a and who can change to b). Homogeneity, then, means that there are available only houses of type A.
- (2) Limited variety: This means a mix of 75% type A and 25% type B. Again, variety is defined from the perspective of the only resident in this model.
- (3) Variety: This means an even mix of houses of the type A and B.

The following table lists the choices for resident a under the various conditions. Under the condition of non-flexible housing, the resident has to move upon change of his demand matrix from state a to state b. Under the

Demand-Supply Simulation

	Outside Area	Neighborhood	House/Dwelling	
<u>NON-FLEXIBLE HOUSING</u>	A A	A A	A a → b	Homogeneity
Frustration			a changes to b	
Move Limited Choice	A B ←	A A	A a → b	Mix: 25%/75%
			a changes to b	
Move Choice, close, far	A B ←	B ← A	A a → b	Mix: 50%/50%
			a changes to b	
<u>FLEXIBLE HOUSING</u>	A → B' ← A → B' ←	A → B' ← A → B' ←	A → B' ← a → b	Homogeneity
Slight Frustration Move or stay choice			a changes to b	
Move or stay Choice	A → B' ← B ←	A → B' ← A → B' ←	A → B' ← a → b	Mix: 25%/75%
			a changes to b	
Move or stay Choice	A → B' ← B ←	B ← A → B' ←	A → B' ← a → b	Mix: 50%/50%
			a changes to b	

TABLE (1)

condition of total homogeneity of the market, his changing needs are frustrated. Under limited variety (homogeneity of the neighborhood, variety further away) he has the choice of a medium-distance move. Under condition of variety within the neighborhood and outside, he has both options.

Flexible housing documents the range of choice which is opened up to the residents whose needs have undergone a change. Under the condition of total homogeneity, he can stay and adjust his dwelling, or he can adjust his housing needs through intra-area or medium-distance migration. In none of the cases are his needs completely fulfilled. B' satisfies his demand better than A could after the demand change from a to b, but a slight frustration remains.

Both under limited and total variety, the resident has the option to stay or to move. Furthermore, he can achieve complete housing satisfaction, or at least improved satisfaction.

What can one deduce from this admittedly oversimplified version of the demand and supply situation under conditions of housing-type variety and housing flexibility?

No flexibility at all causes mobility (the change of one's living space). Under conditions of total homogeneity or limited variety of the market in question(26), the flexibility necessary to adjust housing to changing needs is severely curtailed. The degree of limitation depends on the size of the sub-market (i.e., in case of discrimination) and on the variety afforded by the sub-market. Required mobility for fulfilling changing demands in housing would render superfluous a requirement for housing flexibility. These two conditions demandate the extremes along a possible range of options. A house which is adaptable to a certain range of varying demand counts-- in an allocational sense--as so many commodities as differing demands might be allocatable within it.(27)

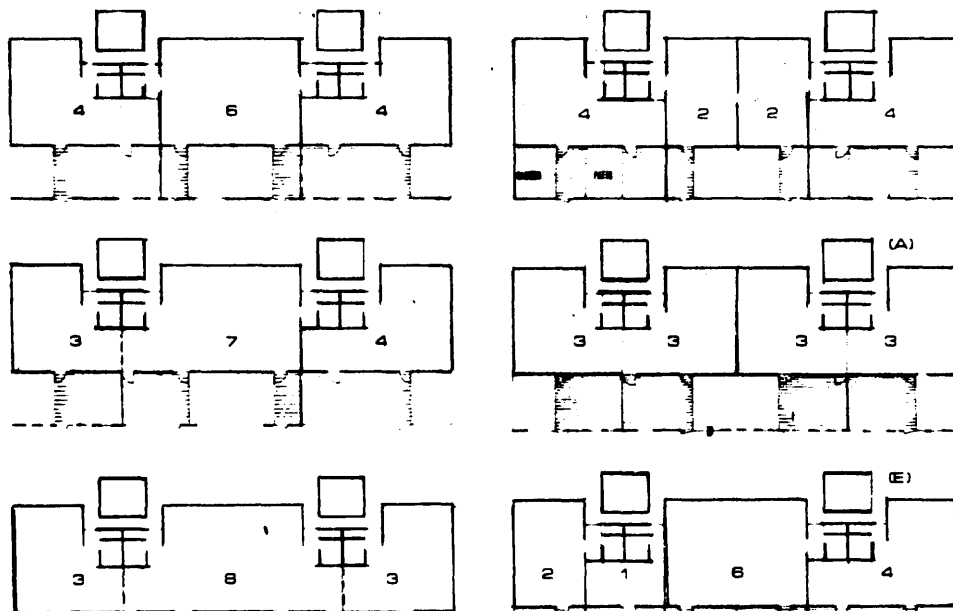


FIGURE 7: PSSHAK (Hamdi and Wilkinson, GLC) Plans showing options available on dwelling size group (AD/11/73, p727)

The concept of adaptable/flexible housing is often looked at from the viewpoint of vacancies. Vacancies here are used as a measure of the tightness of the market. It is concluded that at very low vacancy rates (around 4%) housing flexibility gains in importance since it would allow the fine grained adjustments which can not be accomplished through moving. But that is not what housing flexibility should be for. Housing flexibility should not be only a tool to correct the momentary imperfections of the supply-demand situation on the market. It should rather be a permanent alternative for realizing demand changes in housing. Technically speaking, there are needs and demand changes which can be realized only by either residential mobility or by mobility and flexibility. All changes for example which are caused by an extreme change of value that is attached to the locational aspect of the dwelling (frustration with noise, condition, services) may be realizable only by moving. A dissatisfaction with the tenure status one holds might cause moving. And the desire to live in a house instead of an apartment will hardly be fulfilled through an adaptable apartment.

This section was meant to establish the importance of variety and housing adaptability for the allocational

aspects of the supply-demand relationship. Already an extremely simple simulation of demand and supply specifications and their potential to match show clearly the necessity to move or to experience frustration or the possibility to stay or to move various distances (choice) under certain "market" conditions. It was argued that already a concept of limited housing flexibility which affords choice and decreases frustration would change the market conditions considerably.

C: Problem and Questions

C.1: A Note on Method

Randall Imai, in his investigation of littering(28), presents a classic case of research methodology. He sets out to investigate the phenomenon of littering in relation to the form of a specific environment, in this case features relating to site planning. This relationship constitutes his major hypothesis. He suspects a severe contribution to littering by the environmental features themselves, and therefore establishes a hypothesis that connects the two. First, the dependent variable is littering, because it is the one acted upon, and his hypothesis establishes this relationship. Second, the independent variable is site-planning features. Through selection of housing project cases, he achieves the variations necessary to measure the behavior of the dependent variable under controlled conditions. The selection has to make sure that other independent variables which also might act upon litter are held constant and that the variation of features related to site-planning is great enough so as to allow more specific--or qualifying--hypotheses. Two steps are left: first, to establish the categories in which the phenomenon litter will have to be measured (form, kind, amount, location, durability, cause); and second, the method to

measure them (he decides on observation and experiment over time). With this, all elements of a classic investigation are assembled.

The title of this thesis contains two elements. The first describes a specific set of data (housing-related moves) and what can be done about them. They will be analyzed, which is to say they will be presented, interpreted and related to a set of categories (or a model) which might consist of activities, space, housing features and the like. The second element of the title contains a hypothesis, which is the major hypothesis of this thesis, that there are trade-offs between residential mobility and housing flexibility. Both residential mobility and housing flexibility are related to needs regarding housing: e.g., moving is seen as an expression of a need that has changed but could not be fulfilled by staying; and housing flexibility is seen as a possible--if not necessary--alternative condition for fulfilling a housing-related need that has changed by providing the option to stay rather than to move. The potential confusion lies in the fact that, on the one hand, both-- residential mobility and housing flexibility--are seen as possible modes to realize demand changes in housing;



but that, on the other hand, residential mobility expresses unsatisfied needs by moving elsewhere whereas housing flexibility is a condition for expressing those unfulfilled needs, but does not do so unless flexibility is actually exercised and thus can be measured. Therefore, housing-related moves are believed to contain data (reasons to move) which can be analyzed and related back to categories which might or might not have bearing on housing. If they have no bearing, it is fruitless to put them into a trade-off relationship with housing flexibility. If they have bearing, it remains to be seen how they have bearing and if housing flexibility could take care of them. And if housing flexibility could take care of them, what remains to be formulated are the characteristics and ~~p~~roperties which such a flexibility would have to have.

The way which has been outlined here is one of linear deduction. Data are being analyzed for the purpose of allowing the formulation of a model on housing flexibility. In the section on Environmental Adaptability (Ch.I/B.1) elements for a model of housing flexibility have been prepared. Two kinds of data will be presented and analyzed that express the attempt to realize demand

changes in housing: in Chapter II reasons for moving, and here specifically housing-related reasons to move (the Rossi study), and in Chapter III adapted/altereD/changed environments (and here specifically the case of Pessac/France). Three topics are in the foreground of the Pessac study. First: What is it in the housing type and environment provided by LeCorbusier that lends itself to attempts at adaptability. This point will have bearing on elements of a model of housing flexibility in Chapter IV. Second: What can be said about the existence of alterations as such with respect to the people that did them and with respect to the environment that allowed them; and what can be said about the amount, type and variation of these alterations. Third: What can be said about the participatory features that were displayed in the process. In the Rossi study--by process of reason analysis--the kinds, amounts, and interrelations of reasons that lead to moves are revealed. The complaint-structure which is revealed behind apparently random moves is used as data source where it relates to housing(29). Conclusions derived from these two kinds of data sources might or might not be complementary or mutually supportive. On the last step (Chapter IV) conclusions from the data will be used to formulate elements of a model of housing flexibility and their properties and form will be discussed.

## C.2: Problem and Questions

The problem can now be formulated in the following terms:

People change residence and by so doing move various distances from their old to their new one. More than one out of five in this country do so every year. These moves are not random events, but have reasons that underly them. Though it might be difficult to separate some of the inherent irrationalities from those reasons, it can be done. These reasons relate to a variety of components of total Lebenswelt like work, people, schools, taxes, dwelling. Some reasons are formed by dissatisfaction with the old (push), some by attraction of the new situation (pull). Housing is involved in those reasons. Housing itself is an ambiguous term and might mean different things to different people. It is even more ambiguous in that in different circumstances it might mean different things to the same people.

The first and specifying hypothesis states that in conjunction with others there are reasons to move that relate closely to housing features like tenure, management, physical and social neighborhood, cost and physical housing features. The second hypothesis states that

there are reasons closely related to the dwelling like location, size, organization of spaces, condition and equipment, and that dissatisfaction with these can be so dominant in the decision to move that they can be isolated from other reasons.

The main hypothesis then states that there are housing-related reasons to move which could be taken care of by a model of housing flexibility that is responsive to those features subject to complaint. In other words, it is hypothesized that with the existence of such housing flexibility, trade-offs might be possible between residential mobility and housing flexibility which do not now exist. For those people whose needs in more closely housing-related categories are either frustrated or trigger a move, an alternative is being provided which allows them to stay if they so prefer. This is important since it is recognized that there are people (low income, minorities, large families, for example) on whose residential mobility severe limitations are placed by the composition of the housing market, by lack of means, by discrimination. Thus the focus of this study is on that segment of the population for whom an alternative mode to realize demand changes in housing would be most beneficial. They are of lower

income, tend to be larger families, belong to ethnic groups or minorities, and are very likely renters of a dwelling and not a house. In short, they are like those people who in Germany would live in tenements within the older parts of cities or in large scale modern housing projects at the outskirts of the city and who would rent their shelter. Although the data presented later relate to owners as well as renters and to houses as well as large-scale apartment buildings, the specification made above is crucial in that it has impact on the kind of housing flexibility that is formulated as workable and realistic. But in general, housing flexibility is seen to be advantageous for all people under circumstances of dissatisfaction which can realistically be met with housing flexibility.

The benefits of such kind of housing flexibility and the resulting possible trade-offs between residential mobility and adaptability are seen to be five-fold:

- (1) It would allow for better fit of the living environment with the change of housing-related needs during the life-time of the resident (short range). It would provide the option to stay.
- (2) It would make the housing environment more responsive to changes caused by relatively unpredictable demand-changes during the life-time of the building (unspecified future change). The more general the concept

of housing flexibility would turn out to be, the more responsive it would be to unpredictable future demands. But even a more limited concept of adaptability would provide more possibilities for future satisfaction of demand than our rigid and fixed housing does now.

- (3) It would involve the user--through decision-making, active participation in alterations, or through both--in shaping his most immediate environment.
- (4) On the level of supply and demand of housing, the potentially greater variety resulting from a concept of housing flexibility would operate in the direction of more allocational options and of a closer match between housing needs (demand) and housing stock (supply).
- (5) In general terms, it would allow a better (that is, longer and more demand-appropriate) utilization of resources.

#### Objections and Eliminations

Many objections can be raised with respect to such a model, and many constraints and limitations can be seen to operate against its implementation. They are: that the way in which economic and political forces in our society produce and shape supply and demand in housing is counter-active to concepts of variety, change, user-involvement and the desire to bring closer together demand and supply; that social injustice and frustration of housing needs is a matter of equal economic opportunity rather than of non-flexible housing; that the politico-

economic process which determines housing is by far more important than the capabilities of the product itself; that dissatisfaction with housing cannot be tackled on a technological level but rather has to be tackled on the level of equal autonomy; that the more important aspect of adaptable housing is the concept of user participation rather than the concept of functional adaptability; that flexible housing is too costly and that those who already have maximum means for mobility could pay for flexible housing, whereas those with the least mobility could not buy their share of either flexibility or mobility.

Many of these topics raised are crucial, and of some others I am at least aware. But they will be dealt with here only peripherally if at all, first because I lack expertise in many of them, and second because they tend to complicate an already complex task infinitely.

#### Questions

Which then are some of the questions that will have to be answered?

a) To what extent are reasons to move related to housing as commodity rather than to other components of Lebenswelt?

b) Can those reasons be isolated and be dealt with relatively separate from other reasons to move? c) Can the constellation of needs underlying the reasons for housing-related moves and observed attempts at alteration be accommodated by the model of housing flexibility put forward in this paper--or by a modified version of it? d) Can adaptability as such render trade-offs possible between mobility and flexibility? If not, what other measures are essential and have to be involved?



## Chapter II

### REASONS TO MOVE

This chapter introduces a set of data which revolve around the reasons underlying the decision to move. It is the purpose of these data to establish the role which housing plays in this decision. The role will be defined with respect to the existence of housing related moves, and with respect to the amount and seriousness of the conditions under which housing is involved in residential mobility. Moreover, those components of housing will be singled out which can meaningfully be related to concepts of housing flexibility. Section A contains a matrix of those descriptive housing features which are used--in real estate advertising--to link supply and demand. Section B presents and analyzes the Rossi study, a major study of the reasons underlying residential mobility. Section C describes briefly an abandoned pilot study on reasons to move.

The footnotes for this chapter can be found on pages 135-137

A: The Language of Supply

In addition to data on housing-related moves discussed in the following sections, this section presents a random sampling of apartment advertisements. This sample is based on the hypothesis that within the market situation of supply and demand, the offering side uses descriptive features for the commodity which correspond to and are sufficiently discriminating for the party that is looking for an apartment. In other words, it is assumed that advertisements represent one form of communication between supply and demand. Were this not true, the advertisement in the form presented here would not fulfill its function, namely trigger at least sufficiently specific interest to connect the offering with the searching side. This conclusion contains its own qualifications. The advertisement--as are other forms of communication--is not the sole base for a deal. But it materializes through information certain features of an apartment or house in a manner which allows the searching party to compare them with his needs. If this hypothesis makes sense, it implies that on the side of those in a search for housing, housing needs (as abstract term for living habits, activities, space requirements and taste) have already been translated

into isolated designations and images which are correlated with similar categories used in the ads. From this line of reasoning could be inferred that the supplying side uses merely the categories in which housing needs are perceived. This is not to say that it is necessarily so, but it is to say that it works. Should it be found that ads are not just a language for sorting out and for making the first connection between supply and demand happen, but that they reflect the true formulation of needs related to housing, then models of housing adaptability have to proceed with the same categories. One hundred random samples were selected from the "Apartments for Rent" section of the Boston Globe during March and early April of this year. Eighty per cent of them advertise openings in various parts of the City of Boston and adjacent municipalities, 20 per cent advertise openings in East Boston. From all the features mentioned in the ads, categories were constructed and frequencies calculated in order to compare the frequency distribution of all cases with the distribution of the East Boston cases. The table looks as follows:

		ALL	E-BOSTON
<u>Location Area</u>	- general (Brighton, Backbay, East Boston, etc.)	100	100
	- specific (off..street, neighborhood name, etc.)	44	30
	- features (quiet, tree-lined, modern urban, etc.)	20	4
	- conveniences		
	-- proximity to public transportation		
-- proximity to Free-way system			
-- proximity to shopping facilities	10	25	
-- proximity to key institutions			
<u>Location Apartment</u>	- type of building (Apartm. House, 3-D, town house, etc.)	12	4
	- floor level	16	20
	- orientation (afternoon sun; specific view, etc.)	8	0
<u>Apartment</u>	- type/size/space (in number of rooms)	100	100
	- condition -- general (modern; renovated; well-kept; etc.)	32	40
	-- specific (large; small; standard)		
	- functional designation (living; bedroom, den; bath; etc)	100	100
	of rooms (large; small; floor-area; etc)	16	0
	(painted; wall-to-wall carpeting)	10	50
	- service area		
-- bath (number; size; equipment)	38	16	
-- kitchen (special features; equipment)	36	50	
-- closet space (number; location)	6	0	
<u>Ameneties</u>	- apartment (porch; balcony; fire place)	12	30
	- building (pool; public laundry; free parking)	12	0
<u>Cost</u>	- monthly rent (utilities included, parking arr.)	84	50
<u>Selection</u>	(ideal for families with kids; no kids; no pets; elderly couple)	10	10
<u>Management</u>	(well managed; owner occupied; janitor)	16	25
<u>Availability</u>	(date; immediately)	90	75
<u>Others</u>	(entrance security system; family ties)	4	10

TABLE (2) : Apartment features in Ads  
 (Source: Boston Globe "Apartments for Rent" section, March-April 1974)

The table allows the following comments:

If decoded, the ads contain a surprising amount of information not only pertinent to the apartment and its condition itself, but also to issues which obviously have impact on the selection and choice process. Special amenities in or relating to the apartment, managerial issues, specification of prospective tenant are some such categories. As could have been expected, four categories are mentioned in all the cases observed: General location, type and size of the apartment in number of rooms, and functional designation of the rooms. Amount of rent should be included here since it is doubtlessly one of the most constraining factors. An explanation for the under-representation of this variable can easily be found in the fact that the sample might include apartments still under construction and therefore without fixed rent. In accord with the above stated hypothesis, these four categories are the necessary and sufficient conditions to connect to preferred area, type of apartment and kinds of rooms required. As additional discriminating features could be listed all those categories in the table which make up 20 per cent or more of the total representation.

These are: more specific location within the area and "character" of these areas; condition and size-specification of the apartment; emphasis on the service facilities like kitchen and bathroom equipment; and amount of rent. To sum up, the above presented table shows the hierarchy of features required to connect demand with supply and allows the tentative conclusion to reflect also the priorities of a prospective renter regarding his housing needs. (1)

## B: The "Rossi-Study"

Many studies concern themselves with the phenomenon of mobility. Few of them present what one could call a reason-analysis. In the case of this thesis, emphasis has been placed on the reasons to move in order to discern from them a relationship to housing in **general**, and to characteristics of the house or the dwelling in specific. It was hypothesized that there are reasons to move which pertain to or are formed by the rigidity and functionally "tied-fit" design of houses and dwellings built today. Reasons to move can be discerned from actual mobility behavior as well as from mobility desires and intentions (2) For the purpose of this thesis, the distinction made is of minor importance because housing flexibility is thought to be in a potential trade-off position with both mobility behavior and mobility desire. The Rossi Study (3) although wider in scope, was selected because it ~~combines~~ combines mobility behavior, characteristics of mobile households, housing-related reasons to move, and the relationship of needs and mobility.

### B.1: Description

"Why Families Move" is the account of a research effort which was undertaken in Philadelphia in 1954. The purpose

of this study was to investigate the impact of residential mobility on households and organizations and to define the moving decision and the process of moving. By way of survey and reason analysis, the attitudes of the residents toward mobility are revealed and the reasons underlying latent mobility desire or the decision to move are documented. Through the construction of complaint indices and specification indices, the reasons to move are differentiated as to allow identification of categories like: dwelling, space and design, location, neighborhood, cost, and "housing image." Although these categories are lacking a great deal of specificity, they have to suffice for the purpose of this thesis.

Four areas of Philadelphia were selected to make up the study sample. In order to avoid a readily available association between mobility-rates and socio-economic status of the residents, the four areas were selected so that each two areas were similar in socio-economic status (high) but dissimilar in mobility (low, high) or dissimilar in socio-economic status (high, low) but similar in mobility.(4) Cross comparisons were now possible which allowed for the elimination of the mobility influence while comparing the status, and vice versa.



Philadelphia was chosen because of its representativeness for similar urban centers in the US with respect to economic structure, population and housing stock. Another reason internal to the study situation was Philadelphia's proximity to New York from which the research was conducted. Families were chosen over individuals because mobility was seen as a unit decision (family) rather than an individual one. All together, 919 cases were included in the sample.

#### B.2: Data on Reasons to Move

In order to sort out all those moves which relate to housing and make them meaningful enough to be applied to housing flexibility, the distinction will be made between voluntary moves and forced moves. In the narrow sense of the word, a forced move is a move over which the mover has no control (like in cases of eviction, fire, demolition of his house, severe income loss, or legal separation). Since this chapter is designed to analyze housing-related moves, inter-city or out-of-state migration is included under forced moves because, at the outset, the involvement of the house in the decision to move is minimal. Since complaints, specifications and attractions (5) will be of the utmost importance in the presentation

of the data, these measures for reasons to move and their relationship to the categories of voluntary and forced moves are shown in the table below.

(1) Typology of moves

and their role for complaints, specifications, attractions

Complaints, specifications, attractions			
	<u>Compl.</u>	<u>Specif.</u>	<u>Attr.</u>
Full Moves	+	+	+
Dissatisfied, no choice move	+	+	-
Forced, full choice move	-	+	+
Forced, no choice move	-	+	-

Table (3)

(Source: Rossi/Why Families Move; p.129)

(2) Classification of recent moves

Free Choice Moves	61%
Forced Moves	39%
Including:	
Involuntary moves (eviction, dwelling destruction, severe income losses)	23%
Inter-City Migration	8%
Previous dwelling occupied temporarily	4%
Newly Married	3%
Others (mainly recently divorced)	1%
100% equals	(444)

Table (4)

(Source: Rossi/Why Families Move, Table 8.1, p.135)

As shown in Table 4, 61 per cent of the observed moves fell into the category of voluntary (free choice) moves. Since Inter-city migration has already been excluded, this 61 per cent are the basis for potentially housing-related moves.

The question as to why somebody moved generates answers that refer to various frames of references. Incidentally, the categories referred to allow also a first classification of reasons to move.

(3) Reasons to move and frame of reference

a) Reasons given to "why move"

A. To secure better quarters, better location	18%
B. To build or purchase a home	16
C. More space required	13
D. Rents too high or house too large	12
E. House sold, repaired, renovated, occupied by owner	10
F. House in need of repairs, burnt or torn down	3
G. Closer to location where employed	10
H. Marriage	3

Table (5)

(Source: Rossi/Why Families Move, Table 7.1, p.125)

b) Answer categories of Table 3.a

I. Characteristics of the former home:

above A:	18%
" B:	13
" C:	12
" F:(in part)	3
not answered in terms of former home	54

II. Characteristics of new home

above G:	10%
" H:	16
not answered in terms of new home	74

III. Decision is not respondent's

above E:	10%
" F:	3
no information as to decision maker	87

IV. Changes in housing needs

above H:	5%
no information about changes in needs	95

---

Table (6)

(Source: Rossi/Why Families Move, Table 7.2, p.126)

c) Housing related moves in context

Table 7.1-A:	(18%)	(Housing, location improvement)
B:	(16%)	(Change of tenure relationship)
-C:	13%	(Changed space needs; dis- satisfaction with space)
-D:	12%	(Change in space-to-cost satisfaction)
E:	(10%)	(Changes external to user)
F:	(3%)	(Changes external to user)
G:	(10%)	(Change in locational needs,
-H:	3%	(Change, but no clear tie to home)

---

Table (7)

Table 3.C shows that only one category (C) is clearly related to the physical aspect of housing. If one keeps in mind that housing-related moves will be analyzed regarding existing trade-off possibilities with housing

flexibility, part of category A and category D and H might justifiably be added to category C. At best, this adds up to about 30 per cent of the reasons mentioned. How comprehensively housing is seen by its residents is revealed in the next table. In questions revolving around the dislikes with regard to the dwelling, a wide range of features were mentioned which have only partial connection to "housing" as seen from the perspective of housing flexibility.

(4) List of "dwelling features"

Open space or garden, outside appearance, nearness to relatives, nearness to friends, number of rooms, garage and parking space, transportation to work, neighborhood reputation, kind of people in neighborhood, kind of schools.

Table (8)

The Rossi study contains data on the dwelling itself as revealed in the complaints voiced. The distinction made between dwelling and location is helpful for the focus of this thesis.

(5) Housing-related complaints

a. Complaints about dwelling

- the amount of rooms
- the amount of privacy
- amount of closet space
- the heating equipment
- the street noises
- amount of air and sunlight
- the rent, maintenance and carrying charges
- the amount of open space around the house

(9) \_\_\_\_\_

- b. Location complaints
- 
- the travel condition to work
  - the kinds of schools around here
  - the kind of people around here
  - the shopping facilities
  - nearness to church
  - nearness to friends and relatives
- 

Table (10)

- c. Significant complaints beside Space, Neighborhood, Cost
- 
- |  |     |
|--|-----|
| Dwelling unit design complaints (kitchen too small, poor fixtures in bathroom, poor layout of apartment, etc.)                                     | 26% |
| Complaints about structure (total structure in which dwelling unit is located, including location in block, exposure, orientation, lack of garage) | 21% |
| Undesirable landuses in neighborhood (complaints about stores, factories, railroads, etc.)   | 12% |
| Complaints about the landlord (not enough services, too much supervision of activities, etc.)  | 24% |
- 

Table (11)

The feature of the dwelling most frequently mentioned as reason to move was space. The following data establish the importance of space as a reason to move and the relationship of this complaint to changes in household size, tenure status, and the relationship between change and complaints in general. (6)

(6) Space of the dwellinga. Objective space pressure and space assessment

<u>Dwelling Unit</u>	Proportion of primary space complaints over household size		
	1-2 Persons	3 Persons	4, more Persons
1-2 1/2 rooms	45%	52%	54%
100% equals	(42)	(21)	(13)
3-4 rooms	41%	41%	60%
100% equals	(68)	(24)	(40)
5 or more rooms		35%	35%
100% equals		(20)	(40)

Table (12)

(Source: Rossi/Why Families Move, Table 8.6, p.143)

b. Household size and space specifications

Proportion citing space as a specification	Number of Persons				
	1	2	3	4	5 or more
100% equals	28%	50	53	55	63
	(65)	(134)	(98)	(86)	(51)

Table (13)

(Source: Rossi/Why Families Move, Table 9.4, p.159)

c. Space complaints/changes in household size

Space complaint assessment	Change in household size	No change
Impact (Primary complaint)	71%	33%
Contributory complaints	9	6
Ineffective complaints	10	12
coverage (total cases with compl.)	90%	51%
Index of Effectiveness	.78	.65

Table (14)

(Source: Rossi/Why Families Move, Table 8.7, p.144)

d. Previous tenure status and assessment

	Previous Tenure	
	Owners	Renters
<u>I. Space Complaints</u>		
Primary Complaints	42%	44%
Contributory compl.	13	6
Ineffective complaints	11	12
Coverage	66	62
Index of Effect	.64	.71
<u>II. Neighborhood complaints</u>		
Primary complaints	35%	12%
Contributory compl.	22	6
Ineffective complaints	3	9
Coverage	60	27
Index of Effect	.58	.44
<u>III. Cost Complaints</u>		
Primary complaints	5%	16%
Contributory complaints	8	8
Ineffective complaints	11	14
Coverage	24	38
Index of Effect	.21	.42
100% equals	(37)	(197)

Table (15)

(Source: Rossi/Why Families Move, Table 8.11, p.149)

A most interesting issue for my inquiry is the relationship between mobility behavior, mobility desire and mobility intentions. Both are measures of different degrees of intensity for the decision to move.(7) There is no reason to believe that the reasons underlying mobility desire and intentions differ considerably from those given for moving. If this holds true, it would reveal a



far greater dissatisfaction with the housing environment and its specific conditions than can be inferred from the number and kind of actual moves. In this light, housing flexibility might be useful not only in preventing moves which otherwise would take place, but also in decreasing dissatisfaction with the dwelling and thereby latent mobility desire.

### B.3: Analysis and Conclusions

In light of the data presented above, the characterization of a move as housing-related remains difficult and somewhat arbitrary. In the eyes of the residents, the perception of housing transcends by far the narrow physical definition which goes along with housing as a commodity. But houses and dwellings are--with a few exceptions--commodities whose market-value is thoroughly separated from its use-value, when offered on the market. In discussing the trade-off possibilities between mobility and housing flexibility, the commodity character of the house--even if designed to be adaptable--will essentially not be altered. For the purpose of this thesis, therefore, I have to insist on separating those more limited housing features from the more comprehensive ones which precipitate as "urban living" rather than

housing. This is not to say that I prefer the former over the latter, ~~nor~~ that housing flexibility might not be suited to bring them closer together at least in the most immediate living space: the house or the dwelling. But it is to say that the production of housing as a commodity--on the one hand--and perception and even utilization of it as urban living--on the other hand--are functions of the politico-economic system of each society and cannot be reversed through adaptable housing.

The second distinction which will have to be made is more complicated. Reasons to move can be grouped into moves caused by pushes and moves caused by pulls. Both may or may not be related to housing. A move caused by push is one which relates to an intolerable situation in the old circumstances. This intolerable situation may have come about because of the needs of a resident which have changed and which cannot be accommodated in the old circumstances (in case of overcrowding in the dwelling). But it may also have come about through the change of the situation itself without a change of needs on the part of the resident. An unpleasant neighbor who moves next door, a change of landlord or management practices, deterioration of the neighborhood, racial change in the neighborhood or house; all can cause a move that is not a forced move.

Therefore, the resident and his housing needs as well as the environment are potentially unstable variables which may be responsible for housing related moves.

A move caused by "pull" is based on an attraction which promises greater satisfaction than staying would yield. Also, these moves can but need not be housing-related. If they are housing-related, it need not mean that the satisfaction with the old place was low but it certainly means that the satisfaction with the new place is higher. The purpose of discussing the perception of housing and of discussing the difference between moves caused by pushes and pulls is to establish a way in which housing-related moves in the sense applicable here might be defined and singled out. As housing-related moves I define all moves which were caused by reasons and complaints pertaining narrowly to housing as a commodity, irrespective of whether they are pushes or pulls.

About 60% of all moves observed were voluntary moves. The rest were forced moves, including inter-city migration for which to establish reasons for the move has no bearing on this study. Table 3.a shows that 13% (C: "more space required") of these moves are narrowly related to the dwelling. If "to secure better quarters" (Table 3.a, A)-

although it is unspecified--is partly applied to the dwelling, and also item D (trade-offs between costs and space), then the total sums up to roughly 25%. If location, desire for ownership, and costs are included in the housing-related moves, then about 61% of all moves could be called housing-related.

Conclusion

Of the actual moves observed, 60% are housing-related in the widest sense. For the purpose of this study, about 25% of the moves are related to housing as a commodity.

The list of "dwelling features" filtered from the discussion about housing needs and housing requirements (complaints and attractions, also specifications) reveals a wide range of meaning with regard to housing. Few of them are applicable to housing as it is bought or leased.

Conclusion

In the perception of and requirements for housing, as held by the residents, the discrepancy between housing as "urban living" and housing as a "commodity" is exemplified.

With respect to the dwelling itself, amount of rooms, amount of privacy, storage and equipment, layout of the dwelling and sub-standard equipment are mentioned. Table 5.c shows that in 26% of all cases, one or all of these features were contained in the list of complaints.

The same table shows also that in 24% of all cases dissatisfaction with landlord, management practices and with the resultant "house-climate" was voiced.

The main complaint (even before "neighborhood" and "costs") with respect to the dwelling is concerned with space. Lack of space is not specified in its relation to the number of rooms or total space. Therefore, it is difficult to conclude whether the needs behind space complaints could be satisfied through re-arrangement and/or sub-division within the total available space, or whether lack of space would have to be accommodated through absolute expansion of space. The data are also not specific as to the kind of space that is needed. Are there enough rooms, but are they too small? Are there enough rooms but is a specific area in the dwelling too small? Is there a room missing? Is there one room that is too small and one even too large (if that exists), and does the space complaint refer to the fact that space cannot be traded-off between them? The data do not allow an answer. But they document the importance of space or the lack of it in the decision to move and in the complaint structure underlying mobility intentions and desires. Table 6.d shows that in more than 60% of the cases space was involved in the decision to move.

In about 40% of the cases, space was the most severe complaint in the move (primary complaint). The Index of Effect which describes the relationship between existence of a complaint and its primary role in the decision to move, is the single highest score for all complaints listed.

Table 6.a-c specifies the importance of space in relation to dwelling size/household size, in relation to household size, and in relation to changes in household size which occurred shortly before the move. Space becomes more and more important the larger the household size is by number of members. Beyond a certain dwelling size, and beyond a certain household size, the importance of space decreases, be that because of less objective space pressure, or be that because of an assessment of the situation as inevitable. (8) The greatest impact of space complaints on the decision to move was observed not with respect to the absolute number of persons per household but with respect to a change in the number of household members.

#### Conclusion

Space is the single most important aspect of the dwelling in the decision to move. This is born out by the score in the complaint index, by the score in the specification index, and in the Index of Effect. The relationship of space requirements cannot be specified on the basis of the available data. Space gains importances with the size of the

family, with the relation between dwelling size and size of the family, and with changes within the family independent of the resultant family size.

The difference in tenure of the residents, or whether they own or rent their place has bearing on their complaints as to dwelling, neighborhood, cost, and in general, has bearing on their mobility behavior. Renters are more mobile than owners. They are more mobile because they are also younger, have less income, are part of a family that is either a core family or in the process of expansion. In short, they are in a more transient state of their lives than most owners. Lack of control over their dwelling and the inflexible property of most of the apartments reinforce this cycle in which the only answer to most changes is to move. Because of cost consideration, the chosen environment is rather narrowly tailored towards more current needs the changes of which render it immediately obsolete in functional or social terms. At this point in the life-cycle, it is hard to pay for over-capacity. Not only the number of children but, even more important, their "spacing" over time defines the requirements which a family has with respect to the dwelling, and more generally to the total life space (peers; schools; neighborhood facilities; protection; crime; indoor and outdoor play areas that are safe; prestige).

Table 6.d indicates the impact of control and autonomy (tenure) on the three major complaints: space, neighborhood and costs. The table reveals that complaints are concerned with exactly the first level above the control threshold; for the renter the most immediate are space and costs, for the owner the most immediate is neighborhood. In the space complaint, the difference in per cent is marginal. But if the impact of the complaint is added, space is much more severe an aspect for the renter than it is for the owner. With the neighborhood, the situation is reversed. For the renter, the space of his dwelling is already beyond his control. On the neighborhood, he has--if the housing market allows--as much or as little control as has the owner. But for the owner, the threshold of control or not runs directly between his property and the surrounding neighborhood which--in terms of amenities, but more importantly in terms of exchange value--is of utmost importance to him. The cost-complaint has two sides. On the one hand, the renter sells his future labor (rent) on a short term basis. On the other hand, he has no say in the amount and in the development (increase) of the cost of his housing. The owner has made long-term commitments, but depending upon his mortgage terms (time and interest rate) and maintenance costs,



he is more flexible and can manipulate the cost of his housing to a certain degree.

### Conclusion

- (1) The translation of desires and intentions to move into actual moves depends on the control over the elements that are involved in the decision to implement the intention.
- (2) Because of the flexibility in modifying their dwelling to suit their needs which homeowners enjoy, and because owning implies a financial commitment to the dwelling, families owning are less likely to want to move, given the same dissatisfactions and needs as renters.
- (3) Renters and owners differ significantly in the impact which various complaints have upon their decision to move. Renters: with respect to those aspects of the rental dwelling which are fixed and outside tenant control--cost and space owners: in contrast, show more sensitivity to aspects they have less control over, aspects of the former neighborhood.

### Summary

Needs, whether severe or light, can be satisfied by a family dwelling or can be frustrated by its deficiencies. The way in which a household's needs are satisfied by its dwelling is an important determinant of mobility desire and intentions. When these needs remain unsatisfied, the desire to move increases. Some families' moving intentions are frustrated because the housing markets present them with few options. This holds true especially for large families of moderate or low income for whom it is difficult

to find suitable housing on the market. Residential mobility can be seen as a process whereby families bring their housing into line with their needs. Some of these needs relate closely to the dwelling and could be accommodated through larger dwellings (over-fulfillment) or through some such flexibility that owner of houses and even of apartments enjoy. Many of these needs, however, relate to requirements and aspirations perceived to be intrinsic to family life like location, safety, private outdoor space, schools, image and the like. The gap between needs and the inflexibility of urban housing in meeting these needs produces the turnover which is called here residential mobility. Most moves occur in the first ten years upon formation of the family. Life-cycle changes based on the growth of the family, on the composition of the family and on the requirements emanating from the activities and interaction of the members of the family, are instrumental in the composition of the demand-matrix with respect to housing. Large dwellings can accommodate more easily the different housing needs characteristic for the entire life-cycle range; over-capacity is hardly as severe as under-capacity. And owned dwellings are also more flexible because of the greater control which can be exercised over them in terms

of alterations, modifications and investment. Almost half of the families who moved had as their primary complaint and reason for dissatisfaction the amount of space or amount of rooms afforded by their former dwelling. It was shown that space complaints were especially frequent and important where large households were involved or where a family had recently undergone a change in size, composition or relationship. To check the position and importance of complaints against attractions by or specifications for the new dwelling, it was established that space, neighborhood location and neighborhood social composition in this order were the most important ones. Cost was leading as attraction which seems to suggest that in the choice between similarly attractive alternatives, cost then enters as an important variable in the final decision. And finally: the control which a family may exercise over the dwelling also conditions the way in which a home may be adjusted to changing needs.

C: Cases from East Boston--An aborted approach

In this section it was intended to present cases of inter-area and intra-area migration relating to housing. The area chosen was the Jeffrey's Point section of East Boston. The purpose of presenting these cases was to supplement the data put forward and analyzed in Chapter II with a few more specific and concrete examples of housing-related moves. By following rather recent movers from their old to their new environment, it was hoped to combine the analysis of complaints (push) or attractions (pull) underlying the decision to move with a comparison between the old and new environment, and here specifically the dwelling. In other words, it was hoped to test the reasons to move against the actual circumstances allegedly responsible for the decision to move.

This approach could not be implemented in this thesis, primarily because of the difficulties encountered which could not be overcome due to lack of time. Nevertheless, it might be worthwhile to spend a short paragraph on the approach taken and on the difficulties encountered in planning this small pilot study.

The "Rossi Study" discussed above has, with respect to my topic, several unsatisfactory features which stem

mainly from the wide range of perspective in which the role of mobility is seen. Reasons to move which can be related to housing are but one aspect of it. Moreover, even those reasons which can justifiably be tied to it with a few exceptions do not relate to those aspects of the dwelling which could be analyzed in terms of housing flexibility. Although the study--as do other data--might establish the importance of housing-related moves within an overall matrix of reasons to move, and although the data allow conclusions regarding the process and features involved in those reasons, there is little evidence which is sufficiently fine grained to arrive at the possibilities and limitations of housing flexibility.

The purpose of the East Boston pilot study was to allow a comparison of moves out of East Boston and moves within East Boston. It was hypothesized that the reasons underlying intra-area moves were closely related to housing, and that the inter-area moves were related to reasons other than housing (job, neighborhood, schools, prestige) as well as reasons related to housing which had little bearing, if at all, on the discussion of potential housing flexibility (aspirations of ownership, private garden, image of the house). East Boston, and specifically the

Jeffrey's Point neighborhood, was selected above all because of my acquaintance with the area and its people, housing stock and service structure. This was thought to alleviate access to data on recent moves; access to dwellings and houses in which alterations had been attempted; and was thought to allow inferences from the reasons to move, on the one hand, and the old and new dwelling, on the other hand. But additionally, East Boston was considered ideal because of its relative isolation vis a vis Boston and the surrounding communities, because of its ethnic coherence, amount of sociability (ties to relatives and friends) and because of the environmental pressures to which it is subjected. The socio-economic characteristics of the population are similar to those already referred to who live--in Europe and to a lesser degree in the US--in multi-dwelling housing or in mass housing, types for which housing adaptability is seen to be most crucial and needed. It was hypothesized that the factors ~~mentioned~~ above to be at work in East Boston would allow a clear distinction between the desire to stay (pull by the old environment) and the desire to move (push by the old environment; pull by a new environment). Because of the tied housing market (vacancy rate slightly above 4%), the relatively homogeneous housing stock (few town houses, predominantly 3-D

and double deckers, few single family houses) and the predominance of renting over owning, the clear distinction between desire to stay and the desire to move out of the area was hypothesized to isolate the home-owner syndrome which in Rossi's study plays such important role in housing-related moves. Through isolating home ownership, it could be expected to be without influence in the cases of intra-area migration.

By way of informal interviews, open-ended interviews, and observation (old, new dwelling; possible alterations), seven cases were developed before the approach was abandoned. Three of these cases constitute intra-area migration, four migration into other areas of Metropolitan Boston; and three out of these four are to communities north of East Boston (Chelsea, Revere) which East Bostonians regard as the most convenient stepping stones to suburbia. All cases establish little additional and sufficiently specific evidence beyond the data in Chapter II to warrant their incorporation into this study. An insufficiently careful interview format was aggravated by a surprising reluctance to recall details and to evaluate them in their relationship to the decision to move.

Generally, it could be inferred that of the inter-area

migration, two cases were based on the opportunity to fulfill a long-held aspiration for home ownership. A comparison between the new and the old accommodation warranted the conclusion that--in terms of space, number of rooms and equipment--the new accommodation was by no means an improvement. The third case of inter-area migration could be called a windfall move in that a dwelling in a two-family house had been vacated and allowed the family to move closer to the wife's relatives and friends who were apparently more important for the social life of the family than were the ties held by the husband. A comparison between the old and the new accommodation revealed a great similarity in type, layout and size, except that the three-decker in which they had moved showed a larger set-back from the street. The fourth case was the most interesting of all in that it revealed a difficulty which formed part of the decision to abandon this pilot study. Although the reasons given for moving related very specifically to the size of the apartment and the number of rooms, to the difficulty to house three girls and one boy in two bedrooms when the boy grows 9, and to the inconvenience to live on the second floor level of a house with little yard space surrounding it, none of these complaints had been taken care of in the new dwelling.



On the contrary, one of the bedrooms was even smaller than before. But the house was a double-decker instead of a 3-D, was freshly painted and, overall, came much closer to the kind of house-image that is associated with living outside the city. Before and after the move, however, the family rented the dwelling.

What looked at first glance to be a housing-related move in the more narrow sense in which I was interested, revealed itself to be a housing-related move which would not have been prevented through housing flexibility. Pointing out this apparent discrepancy to the father of the family, he conceded that the push-effect to leave East Boston had been based on the reasons given at first, but that, while searching for a new apartment, he did not encounter anything he could afford and liked as much as this apartment. The demand-matrix which had triggered the move obviously had changed in the process of searching for new housing and was still used to justify his decision of choice. This points to the tendency to relate subjective feelings and preferences to an apparently objective "list of housing needs." It points to the fact that the decision to move is based on a tightly interwoven net of subjective considerations and "objective" needs which makes it difficult to distinguish

them or to anticipate them in order to render possible a definition of the range and sequences of realistic housing flexibility. It suggests the conclusion that reasons to move--as long as they relate to more specific elements of the housing environment--might be much less "rational" than assumed in studies of needs in relation to the dwelling. Moreover, it renders dubious the attempt to replace the tight-fit functional approach in designing housing (especially mass housing) with a housing flexibility that is based upon the "three statistically secured"(9) changes of needs and their spatial correspondence.

### Chapter III

#### ADAPTED ENVIRONMENT

This chapter introduces data which are seen to add further insight into housing needs and the physical responses when they change. Upon formulation of the thesis title, the inclusion of these data was not intended. But in the course of defining the usefulness which the analysis of housing-related moves may or may not have with regard to housing flexibility, it was discovered that the inclusion of a second set of data expressing the attitude towards the house and specific housing features might allow cross-comparison between the two main sets of data. Therefore, the title of this thesis should rather read: Analysis of housing-related moves and alterations : Trade-offs between residential mobility and housing flexibility.

One example of an adapted environment will be presented: the workers' settlement at Pessac by Le Corbusier.

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The footnotes for this chapter can be found on pages 138 - 139

A: The Pessac Study

The Pessac study(1)--although it is again only of modest specificity--was chosen over others because of its apparent richness of observations concerning the occupant's attitudes towards psychological (image) and physical properties of the environment they live in. Three topics are in the foreground of this inquiry: first, the kind of alterations that took place and their relationship to the suggestions put forward in section IB.1; second, the characteristics of the houses in which alterations took place and the extent to which these alterations were made possible by those characteristics; third, the phenomenon of participatory interaction between user and environment.

The data used for the analysis will be presented in three different formats: (1) schematics and illustrations describing the project layout, house elements, housing types, alterations observed; (2) verbal data in the form of quotations by residents of Pessac (plus a few others) pertaining to certain attitudes and housing features deemed relevant for this investigation. (Excerpts of interviews are grouped under relevant headings.); (3) verbal data as extracted from the interviews and put

into list form.

A.1: Description

The Pessac project was undertaken as a direct result of a group of ten houses which Le Corbusier built in 1920 at Lège. His sponsor, Mr. H. M. Frugès, an industrialist with interest in the sugar industry in the Bordeaux region, had seen articles by Corbusier and Jeanneret describing their new concept of architecture and housing. He commissioned Le Corbusier to plan between 150 and 200 units of housing for the workers of his industry at Pessac, near Bordeaux. Although Corbusier's proposal encountered opposition by some politicians and the residents around Pessac, the project was begun in 1925 and construction completed by 1926 in which year the opening ceremony was held for the project. Corbusier recounts the public opinion: enthusiastic 1%, sympathetic 2%, hesitant 2%, worried 40%, convinced that I had gone mad 55%. The project was not occupied until late 1929 due to opposition from the municipal authorities. Through supportive legislation and a more than cautious public relations campaign, the 51 units ultimately completed found buyers and renters. The population was initially working class and is now working and lower middle class.

Specific socio-economic profiles on the project cannot be found in Boudon's account of the Pessac situation. One hundred seventy four people lived in the project at the time of the research (1967). About 50 of them were subjected to non-directive interviews revolving around the residents' perceptions, experiences and feelings regarding their environment. Numerous informal conversations, house visits, observations and outside opinions make up the network of the "data."

Four house types are used in Pessac, three two-story and one three-story type with roof-gardens, terraces, and open arcades at ground level. All types are based on three floor-area modules, ranging from 5 x 5 meters and 5 x 2.5 meters to 2.5 x 2.5 meters. The normal house type has the ground floor dimensions of 5 x 12.5 meters or 5 x 15 meters. The town planning concept, derived from the garden city concept, contains groupings of the housing types of the following kind: completely detached; semi-detached; rows of four to five houses reversed against each other by 180 degrees. The official name of the project is "Quartiers Modernes Frugés." One of its nicknames is "Frugés cubes of sugar."

A.2: Data

(1) Schematics/Illustrations

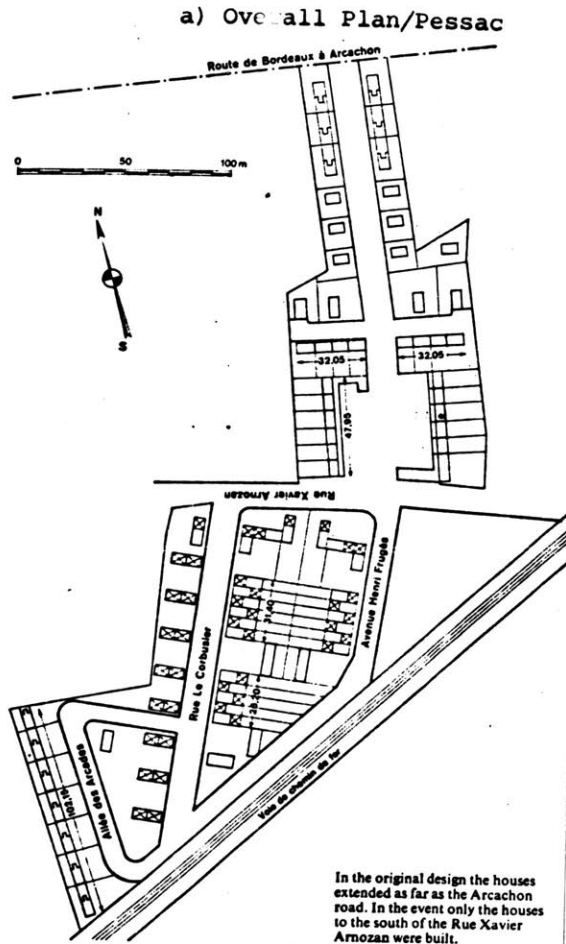
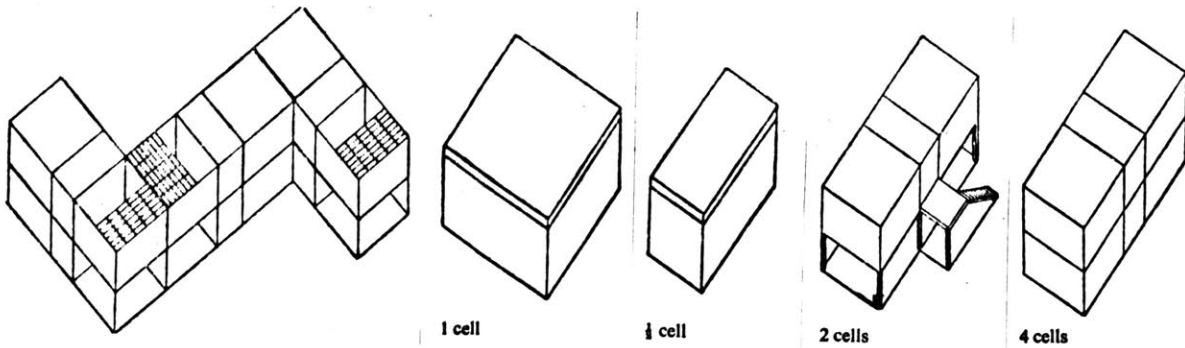


FIGURE 8: Boudon, p 41

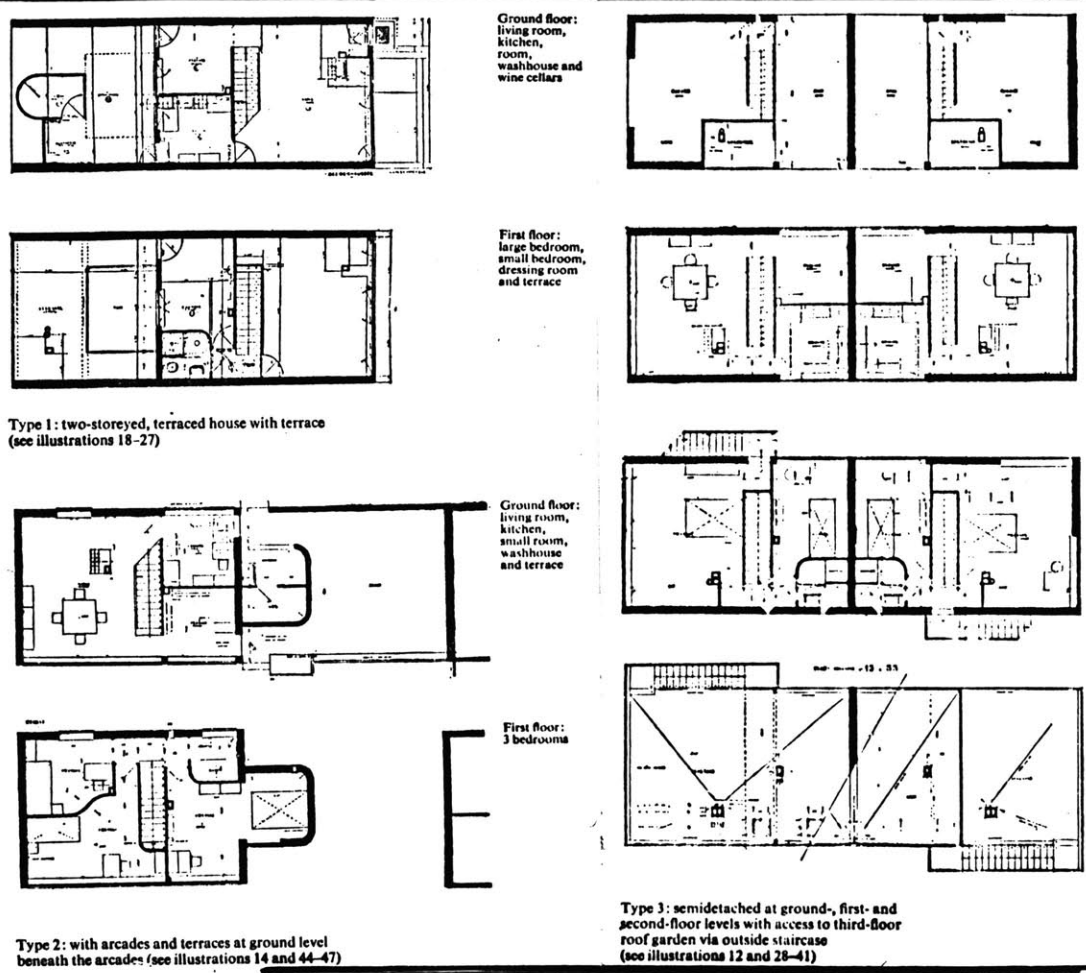


FIGURE 9: Boudon, p. 50

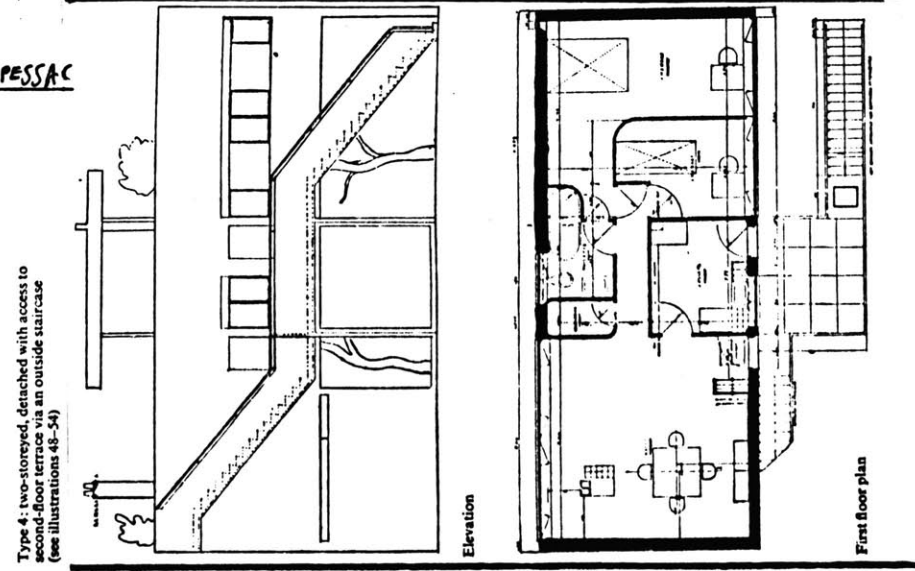
FIGURE 10: Principle of Standardization (Boudon; p44)



c) Schematics of four housing types at Pessac

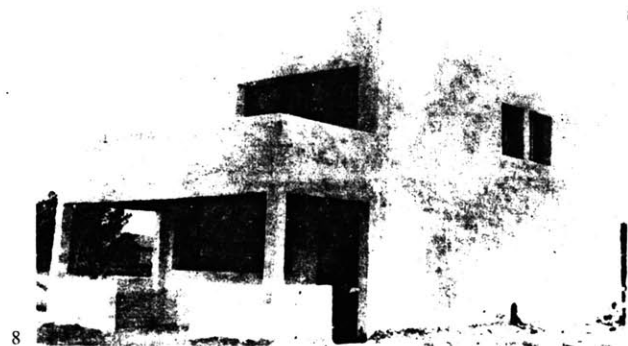
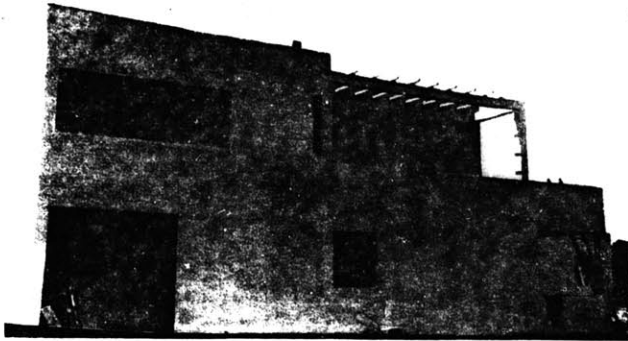


**FIGURE 11:**  
**TYPE 1-4 AT PESSAC**

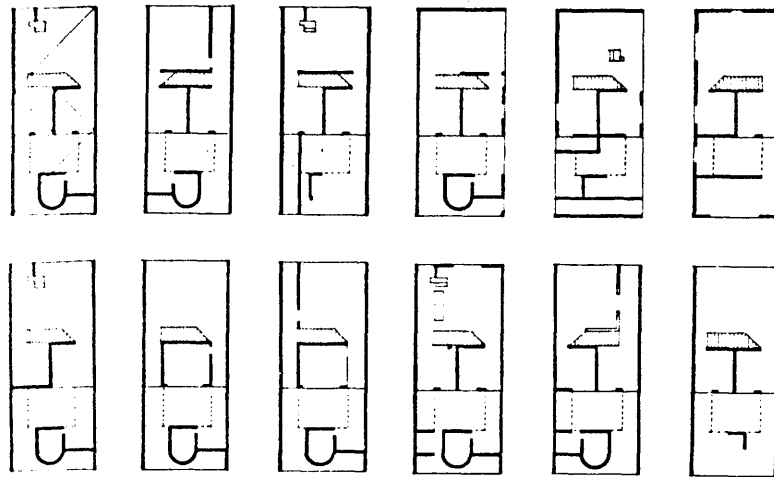




d) Illustrations of external alterations (ILL. 1)



e) Range of floor plan alterations encountered/example



Le Corbusier's original design is on the top left.

FIGURE 12: Alterations, Type 1 (Boudon, p.121)

(2) Verbal data/quotes

(A) Outside opinion

(A/1) An architect on Pessac: Apparent failure

"That is why the people of Pessac are trying to change their houses and make them more personal, because there is no possible way in which they can impose their will on them...."(2)

(A/2) Le Corbusier: Standardization

"Standard components are letters; with those letters, and in a particular way, you have to spell out the names of your future house owners."

(3)

(B) Users' attitude(B/1) Pessac resident: Autonomy

"We-all-of-us-always-have-our-own-ideas!  
 We want our own home--don't we!--for ourselves...  
 and we want it the way...the way we want to have  
 it."(4)

(B/2) Pessac resident: User as architect

"Yes, well...an architect...well, of course,  
 we could have had it done by an architect, and  
 it would doubtless have been done better...  
but not the plans...not the plans, because it  
 was my husband who conceived the plans, and  
 made a good job of them...."(5)

(B/3) Pessac resident: Qualification

"Apart from that, these houses are alright....  
Nonetheless, there is a living room in these  
 houses...there is none the less."(6)

(B/4) Pessac resident: Tradition

"What I find so ugly about these windows is  
 the metal uprights, you see, there are too many  
 of them. A window like this should either be  
 completely blank or else it should have little  
 square panes..."(7)

"It was surprising, after the traditional  
 lean-to houses, to see these terraced roofs...  
these houses have no roofs...."(8)

(B/5) Pessac resident: Alternative assessments

"What does my wife think?...Well, now...as  
 an intellectual...she rates the house highly...  
 not as highly as I do...but highly enough.  
 Well, on the other level, I must admit, she  
 was not exactly...for reasons which were not  
 directly connected with...well, primarily on  
 account of the heating and the badly fitting  
 windows...the point of view of the mother..."  
 (9)

(B/6) Pessac resident: Change over time

"As I told them...do it for yourselves, don't  
 convert anything for your children, because no  
 matter who moves in when you leave, whether  
 it's your children or strangers, they're bound

to pull something down. They won't like the way they are. You've put the door there, they'll want it over there! You've closed up a wall to make...they'll build a door in it or else knock it down to make a larger room (and that's happened before now). There are houses down there; the people took out a large partition wall, made a large kitchen and thought it was absolutely marvelous...and now, huh...the good man has put the partition back, so that the kitchen's the same size as it was before, in order to make an extra room for one of his children...you see?... people will always make changes...there's nothing 'amazing' about it. No...any house, no matter how well designed it might be, will never completely suit the family that goes to live in it...There's always something that needs to be changed. It does no harm...and it's good for trade.... I've lived here for twenty years now and I've seen it happen time and again; there are houses that have had three or four different owners, and they've all pulled down something or other and then rebuilt, each according to his taste...it's a way of life..."(10)

(C) Properties of House

(C/1) Pessac resident: Potential

"I bought the house in five minutes. I didn't like the interior of the home but I immediately saw the possibilities."(11)

(C/2) Pessac resident: Fit (or its failure)

"Any house, no matter how well designed it may be, will never completely suit the family that goes to live in it."(12)

(C/3) Pessac resident: Generous room size

"The large room...is very large...Incidentally, they call it the large room, but the real point about it is that it is large. You can see for yourself...it is large...that's a large area, isn't it!...the small room is a bit too small... a little bit."(13)

"There's space...plenty of space. That's why people have knocked down partition walls, realigned them and generally rearranged things...."(14)

(C/4) Pessac resident: Multi-purpose use  
 "...but the point is that, although the houses are the same, the layout of the rooms is different. For example, take the house where a friend of mine lives; in his house this room, which is our dining room, is their kitchen...and they don't have a dining room.... The rooms have been switched around. And then upstairs, one of the rooms instead of being a bedroom as it is here...is an office.... It's like that in all the houses...no doubt he was anticipating something, although I don't know what...we'll see...perhaps the future course of events..."(15)

(C/5) Pessac resident: alteration/possibilities  
 "...There are a lot of alterations to be made in these houses...To my mind, there are as many different styles of architecture as there are houses..."(16)

"...You can make two rooms out of this one by dividing it down the middle...which would be completely in line with present day design... Oh! there are all sorts of possible arrangements... You know, my husband has made thirty-six different designs."(17)

"But there is a certain...flexibility which makes it possible to adapt to new needs...to introduce new elements into a framework that was not really designed to receive them..."(18)

"Yes. Look, a house that...this used to be the kitchen here and there were two more rooms plus the living room...but now I have three rooms, this kitchen area here...and the living room... which is the same size as before...so you see basically...it's a four-room flat..."(19)

(C/6) "As I told them...do it for yourselves, don't convert anything for your children, because no matter who moves in when you leave, whether it's your children or strangers, they're bound to pull something down. They won't like the way they are. You've put the door there, they'll want it over there! You've closed up a wall to make...they'll build a door in it or else knock it down to make a larger room (and that's happened

before now). There are houses down there; the people took out a large partition wall, made a large kitchen and thought it was absolutely marvelous...and now, huh...the good man has put the partition back, so that the kitchen's the same size as it was before, in order to make an extra room for one of his children...you see?... people will always make changes...there's nothing 'amazing' about it. No...any house, no matter how well designed it might be, will never completely suit the family that goes to live in it...There's always something that needs to be changed. It does no harm...and it's good for trade.... I've lived here for twenty years now and I've seen it happen time and again; there are houses that have had three or four different owners, and they've all pulled down something or other and then rebuilt, each according to his taste...it's a way of life..."(20)

(0/7) Pessac resident: Unfinished house  
 "Yes, that's right. He (the occupant) has his house built and then he finishes it...that's the right way..."(21)

"I find that where a house is concerned, they should do all the basic work...but it's a waste of time finishing it...and then, when the boy takes it over he'll rearrange it in his own way, to suit himself...these houses are unfinished..."  
 (22)

### 3: Verbal Data/Extracted

#### a) Alterations observed

- erection of pitched roofs
- blocking of strip windows (observed in 50% of the cases)
- walling-in of open ground floors, arcades
- construction of traditionally patterned extensions (add-on)
- erection of sunburst gates
- alterations of original colour schemes
- roofing-in of patios
- fitting-in of window boxes
- alterations and variations of the original open floor plan

b) Variations in use of rooms (observed)

One specific room was used in following different capacities: 1) as entrance hall; 2) as office; 3) as bedroom; 4) as living room; 5) as hairdressing salon; (in one case); 6) as studio for artisans or handymen.

c) Characteristics allowing and/or facilitating adaptability

1) open floor plan; 2) concentration and minimum size of service facilities (bath, kitchen, storage (obviously a mistake)); 3) minimum internal space solely for circulation; 4) multi-use of staircase; 5) spaciousness of rooms (overcapacity); 6) relative undifferentiated sizes of main rooms (multi-use possibility); 7) partly open ground floor, terraces, roof garden (built-in overcapacity for add-in and add-on); 8) wide windows, open facades (fill-in easier than tear-out).

A.3: Analysis and Conclusions

What then, in the account of the workers' settlement at Pessac, can be useful for this study? Pessac is a very specific case in that it is small in size, in that the accomodation are houses and not apartments, and in that most of the occupants own their house rather than rent it. But all these facts were known beforehand. They do not interfere, therefore, with the model character of this study, in which they have a certain place. From the presentation of the data, and here especially of the section dealing with verbal accounts by the residents, it can legitimately be said that explicit reference was made by the residents to the three main concerns of this section: 1) kind and variety of alterations; 2) properties

of the house; and 3) participatory features (users' attitudes).

(1) Alterations

The potential of the house type for alterations and for a variety of uses of the same room (even without alterations) is either taken for granted or explicitly referred to. The actual utilization of this potential evokes, as a matter of fact, so little excitement on the part of the residents as to allow the conclusion that houses other than alterable ones do not exist for them. More attention is paid to the kind of alterations and further future plans than to the fact that it was possible in the first place, to carry them out. In some of the interviews, it becomes apparent that the knowledge of alterability is almost as important as the actual exercise of it. In several accounts, residents enumerate the possibilities they see for rearrangement without spelling out what they have actually done about them.

Conclusion

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In the Pessac case, the potential of the houses to adapt to changing needs and tastes is clearly recognized. Alterations with respect to internal and external features of the house have been carried out with great frequency.

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Possibilities of alterations or alterations actually undertaken are rarely related to specific needs or changes of



a kind which might have triggered a physical response. In this respect, the case of Pessac does not yield a great deal of useful data. By relating observed changes within or around the house to explicit needs or ~~changes~~ changes of needs of the residents, it was hoped to arrive at a more defined understanding of the performance-criteria of housing flexibility suitable for trade-offs. In the interviews, none of the categories of needs are referred to which for designers seem to be of utmost importance. In one case, the size of the family (large) is cited as reason for a subdivision which results in more rooms that are suitable as bedrooms. In a second case, a room has been created for a child that has grown too old to stay in the room of the parents. The other needs referred to fall within categories which in themselves might make a strong case for the benefits of adaptable dwellings, but which have little resemblance to the discussion of "life-cycle" changes that is often associated with flexible housing. Space, for example, and its role in the change of "family-needs" is rarely made mention of in the interviews. The generous dimensions of the rooms and the age of the occupants might account for this fact. Needs underlying alteration plans or alterations, therefore, can be grouped into two broad categories: The first, mentioned above, can be called "rational." In this category fall cases

in which the patio was walled-in because an extra room was needed; in which a room was sub-divided because one of the children grew old enough to have his own room; in which the open space under the house at ground level was transformed into a studio because the father liked to do carpentry. As far as the data in the Pessac study are concerned, this category is barely represented.

#### Conclusion

In the Pessac case, there are a few cases of alterations which are based on changes of needs or needs associated with person-per-room ration, with number of necessary rooms, with new uses and function which have to be accomodated in the physical structure of the house.

The second category, much more frequently referred to by the residents, will be called here "non-rational." This is but a working term for attitudes towards the house and towards the benefits of adaptability which are difficult to anticipate--let alone predict--but which seem to have considerable impact on a concept of housing flexibility. The reasons mentioned here are change of taste; conformity with tradition; acceptance from the neighbors; expression of likes and dislikes; feelings about the "useful purpose" of rooms; ideas about modernity; feelings "to come home." Because of the possibility to rearrange, these needs which have to be accomodated--if not fulfilled--by the house cause alterations, and the actual alterations--as process and

product--contribute to the satisfaction with the house.

### Conclusion

In the Pessac case, there are frequent cases of alterations and rearrangements which are caused by the desire on the part of the residents to shape their living space according to their changing ideas, tastes and emotional needs.

### (2) House Features

The house features which allow alterability are clearly recognized by the residents. This is not to say that they have categorized them in an analytic fashion, but in describing the what, how and, less frequently, why of alterations, they refer to features which facilitate their task. Mentioned are: the staircase in the middle of the room which makes it easy to close off at either side; the spacious rooms which allow two reasonable rooms through subdivision; the existence of garage, patio, roof garden, open ground floor (overcapacity) which all can be manipulated or put to different uses; the spatial concentration and small size of the service rooms which are not in the way when altering; the relatively equal size of rooms caused by the floor-area module which allow adaptation to various uses; the strong loadbearing walls at the periphery of the houses and manipulatable structures within the envelope.

Conclusion

Concentration of structure and services, relatively undifferentiated room dimensions, absence of functional designation of rooms, and overcapacity are seen as facilitating or even enabling adaptability and alteration.

(3) Participation

Alterations could only take place because of the confluence of possibility and willingness. Le Corbusier did not involve the residents in the planning of his housing. He too was designing for an indeterminate market. Participation, therefore, does not refer to the strategy through which the project came about. But it refers to the degree of control and to the degree of involvement which was exercised in the Pessac case. One resident defines the task of the architect as assisting him to implement his plan. To build the house is the responsibility of the architect, but the user brings to him "his own plan." Very little is said by the resident about the advice received and the technical assistance required to carry out the alterations. But it is clear that they were involved in the planning and implementation of the changes. They seem to think that it is the way it should be. Needs change all the time, within a person, within a family, and even more among consecutive generations. Things are torn down, re-erected and altered, and as long as money, skills and

ideas allow, one should see to it that it happens. A distinction can be discovered between renters and owners. As far as owners go, autonomy(23) does not seem to pose a problem. But the few references with respect to tenants seem to suggest that they too have plans but not the same freedom to implement them. Since many of the tenants, however, are long term occupants of their houses, the difference is not as crucial as one might expect in a normal urban market situation.

#### Conclusion

In the Pessac case, the residents have considerable control over the environment and are involved in planning and implementing the changes in their environment. To a lesser degree, this holds true also for residents who rent rather than own their house.

## Chapter IV

### TOWARDS HOUSING FLEXIBILITY

The growth and flexibility of an architectural organism are not really possible except in a new conception of architectural quality. And this new conception cannot be formulated except by means of a more attentive exploration of those phenomena of creative participation which are labeled "disorder."(1)

A number of families said they could not get units of adequate sizes in the projects. It is obviously impossible to plan so that all families can get units of appropriate size when they need them. Nonetheless, it is necessary to check periodically upon the space requirements of low income families so that new units added may be of such size as to adjust the distribution of a program in a locality to the needs of the population to be served.  
(2)

The two quotes which introduce this chapter shall illustrate the range within which the data on moves and alterations in housing might be applicable to a concept of housing flexibility that renders possible trade-offs between residential mobility and adaptability of housing. On the one hand, an approach which views growth and flexibility not only as a means to bring in line housing needs and housing space, but which looks upon them as concepts which would radically alter the relationship between housing and its user and between the architect and his client; on the other hand, the admitted need to check the space

requirements periodically, so that additional units are closer to demand.

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The footnotes for this chapter can be found on pages  
139 - 141

A: Tentative Conclusions

J. Habraken, in his book Supports: Alternative to Mass Housing(3), sees the purpose of housing as the provision of rules for a game, not for life. What went wrong in the Modern Movement in architecture, he contends, was the pre-occupation with the dwelling as a machine ("Machine a habiter"). But the properties of a machine are exactly those which stand in the way of our understanding what housing, as process and product, should be about. A machine is conceived and constructed to fulfil a definable task in the most efficient and precise manner. If the task changes, a new machine will have to be constructed. Housing as a process which circumscribes the fulfillment of functional and emotional needs through interaction between person and environment has very little to do with this kind of machine philosophy. The preoccupation with the construction of a need-matrix in housing and its most ingenious translation into dwelling design and dwelling space was supposed to solve the housing problem once and for all. The result of this approach, which on a large scale finds its expression in mass housing, is described by Habraken in the following way:

All the occupant can do is to try and move to a better dwelling. The system therefore invites a



constant game of musical chairs.... The brick-and-mortar statistics put forward by Mass Housing make an organic mix virtually impossible. This results, if taken to their (statistics) ultimate conclusions, that a person should move house at each new stage of his life, at each change in the composition of his family life.(4)

The problem described above is caused by two factors.

First, the needs of a resident change over time. Some changes can be more or less anticipated, some cannot. What cannot be pre-planned is the mutual relationship and priorities of various needs which--in an overall analysis--determine the choice as to housing. Second, the user is in most cases only statistically a known entity. Three strategies have been promoted to cope with this dilemma. One concerns itself with even more profound research into the need structure and its change over time. This means to out-do the functionalists. A second has placed emphasis on the user. If the user were known, he could have input into the design of his shelter space, as was the case in the traditional relationship between client and architect. This strategy aims essentially at a revision of planning and designing for an indeterminate market. But even if this reversal of the prevalent dilemma would be possible and if the user would direct and instruct the architect to his needs, those needs still undergo changes which can only be vaguely anticipated by

the user himself. The third strategy concerns itself with a combination of all of them. On the one hand, housing is being planned and built for an indeterminate market. And this will not decrease but increase in time to come. On the other hand, research into needs and need changes may help to define--not the dwelling of the most perfect fit--but the most general kinds and ranges of changes which realistically should be accommodated by a dwelling design. Many changes of needs lead inevitably to a move, and there is nothing wrong with that. But many moves come about which are not desired but are seen as the only alternative to frustration with an overly rigid and tied immediate living environment. Habraken might well be at the extreme end of this third possibility. His approach includes variation, adaption, subdivision and growth of the dwelling, all of which are means which--if realized--allow responsiveness to a wide range of requirements associated with possible changes in housing. Pinney(5) in his study of housing flexibility comes to similar suggestions.

As far as means of housing flexibility are concerned, the dividing line is placed exactly there where a chosen mode of adaptability includes change which requires growth

of the spatial envelope. For private (control) detached (overcapacity) property, the possibility of accomodating change through growth of the house is not only possible but is already being exercised. It has then the less ambitious name "expansion" or "addition." This is possible because all elements which are necessary for this means of adaption are controlled by the owner: knowledge of the change of need, capital, land, space, and timing. Apartments, in contrast, even when privately owned (condominium) are spatial envelopes which are by themselves enclosed by a larger envelope, the house. Since the owner of a house enjoys already a potential flexibility of all kinds (add-in, rearrangement, sub-division, add-on) which the tenant or the resident of a multi-level apartment building does only marginally enjoy, a model of flexibility for housing will have to be guided much more by the limitations which are posed by this concept of housing.

It is therefore interesting to see that there exist only two concepts with respect to multi-level, multi-unit apartment buildings that include growth as a means to respond to changing needs. One, somewhat unrealistically, allows growth of one unit at the expense of an adjacent one.(6) This concept assumes a periodical re-definition of the overall housing demand in a structure. Accomodation

of specific demands is accomplished through either expansion or contraction of a dwelling when adjacent demand allows; or through re-allocation of occupants within the structure of the house. So much for the short range properties of this concept. But it also allows for a significantly varied composition of distribution of dwelling sizes throughout the house.(7) The advantages of this kind of adaptability within the house are apparent. In terms of long-range changes, the house is responsive to a wide range of family sizes. But it allows also to cope with the dilemma of the indeterminate client. If the actual size and configuration of a dwelling is determined upon occupation by the resident, he can--at least at the start--have input in the shaping of his shelter. Another concept which attempts growth in multi-dwelling structures is exemplified in the approach taken by both Habraken and Pinney. Basically, this approach applies the advantages of a detached single family house to an apartment building. This is expressed in the distinction between support (infrastructure, services, communal space) which has the function of land in the third dimension, and detachable dwellings which have the characteristics of a single family house. The device of zoning regulates the relationship between land and house and between private and

public space and activities. Zoning, here, is comparable to land-use zoning and site-planning. Several problems are solved which in traditionally-built apartment buildings prevented change of needs to be accomodated through growth.

(1) The apartment (or detachable dwelling) is freed from the loadbearing structure of which, in a multi-unit structure, it is a part.

(2) Through zoning, areas for dwellings are defined which can be subdivided into lots as is common practice. A building lot can be purchased or rented and the dwelling on it may fill up the entire lot or part of it.

(3) Through the extension of land into the third dimension, through higher densities and a more efficient supply with utilities, a lot should be cheaper than a similar piece of land on ground level.

(4) Because of the separation between envelope of the dwelling and evenlope of the support (detached) the former may expand or contract without impairing the latter.

After this lengthy description of the two basic concepts accomodating change and growth, a synopsis of the data will help to establish the range deemed necessary, sufficient and realistic for a proposal for housing flexibility. But before proceeding along these lines,

some of the questions which were asked at the beginning of this paper will have to be answered at least tentatively.

#### Question a

To what extent are reasons to move and alterations observed related to housing as a commodity rather than to other components of Lebenswelt?

#### Answer

Dissatisfaction with design features, layout, size and style of a dwelling are reasons to move. An especially severe complaint about the dwelling revolved around the space afforded by it. Space could not--according to the data--be differentiated as to its more specific meaning. Whether the number of rooms of the dwelling, the total space of it or the impossibility of trade-offs between the space of one room and another are at the roots of this complaint cannot be answered safely. But it is assumed that the majority of complaints in the space category related to the total amount of space in a dwelling. The complaints closely related to the dwelling comprise between 15% (conservative) and 40% of all reasons given for moving. If, in addition to mobility, mobility desires and intentions are considered, the reasons relating closely

to the dwelling (that is without complaints about tenure, location, management problems, etc.) comprise about 60% of all reasons given for moving. By looking at alterations carried out at Pessac, few explicit reasons were given for alterations which would corroborate the categories mentioned above. But alterations like rearrangements, subdivisions, add-ins and add-ons were observed which reflect spatially a change of housing demand. In addition to these, numerous alterations were performed which satisfied residents' ideas as to taste, tradition and image, and reflected the process by which functional and emotional identification between user and environment took place.

#### Question b

Can those reasons be isolated and dealt with relatively separate from other reasons to move?

#### Answer

The data in the Rossi Study seem to suggest that they can be dealt with separate from other reasons. The measurements of complaint and effectiveness of a complaint allow the conclusion that some reasons are so dominant that they constitute the basis for the decision to move. It is apparent from the data that in the fewest cases of a move

only one reason was given. This seems to suggest that the reasons are grouped in a matrix whose fields are of different priorities and have different impact on the actual move. Rossi expresses this by calling some of the reasons "primary" and others "contributory." It is interesting to compare out of which categories various reasons come that contribute to the decision to move. These reasons either fall within the same category (space, amount of rooms, layout) or they are complimentary (space, home ownership). The latter is interesting because it is conceivable that constant problems with space and realization of minimal control and the possibility to do something about this, nourishes the desire for home ownership. This is to say that if the space problem could be solved and an even limited control by the user over his living space be established, the inevitability of home ownership as the only alternative may be weakened. This speculation is supported by the case of Pessac where alterations were undertaken by owners and renters. It is also born out in Beinart's study of environmental change in Western Native Township (WNT)(8) where all changes observed had been undertaken by renters and where a comparative calculation of spendings for alterations established that renters had spent the same percentage on



changing their houses as had owners. On the other hand-- and here less because of lack of control than because of reluctance to invest in housing that is not owned by the investor--a few renters in Pessac seemed clearly to experience the frustration stemming from the need for alterations and their non-realization.

The answers to questions c) and d) of the problem statement will be developed in the following section. These questions were: c) whether the reasons underlying moves and alterations could be accommodated with housing flexibility, and d) which supportive measures might be needed to make housing flexibility work.

## B: Some Elements of a Model

The evidence accumulated in Chapter II and III and reviewed in the previous section is much less specific than hoped for and possibly too fragmented for a complete definition of a model of housing flexibility. To construct a safer basis, therefore, a pilot study of the kind described in section II/D might be helpful and necessary. But given the evidence available, and given further that it was not the purpose of this paper to design an ultimate need-matrix with respect to housing, but on the contrary, that such a matrix was considered to be of only limited usefulness for this purpose(9), it might be possible to list some suggestions for flexible housing.

By beginning with the characteristics inherent in traditional design practice in housing, it might be easier to single out the modifications which seem to be necessary for flexible housing.

### Present Design Characteristics

- (1) Spaces are generally designed for one function only and are difficult to use for purposes other than they were designed for. The size of a typical bedroom, designed around the dimensions of the bed, and the size and shape of the window (high, small) and position of electricity outlets (at both sides of the bed) are an example in case.

- (2) The proportions of rooms are closely defined by the projected purpose of the room.
- (3) Rooms are equipped with function-related fixtures, built-in furniture, etc., which reinforce the functional determination of the space.
- (4) Generally, only one living space (living room) is provided.
- (5) Only one access to dwelling and that to a carefully designed circulation space which determines access to other rooms.
- (6) All other rooms except the living room are accessible only through a system of hallways which serve no purpose other than for circulation.
- (7) Single door access to all rooms.
- (8) Outdoor space usually accessible only through one room, most likely the living room.
- (9) The general layout of the floor plan is based on the minimization of distance between associated functions. That way, not only rooms are narrowly determined but also groups of spaces and their spatial inter-connection.

From the data on reasons to move and alterations the following needs can be abstracted which constitute the necessary and--in my eyes--sufficient criteria which housing flexibility has to meet:

Need

To accomodate or signify a change in family make-up, activities or relationship.

Required Changes

Increase or decrease in the number of bedrooms. Space which can be set aside for activities like playing, studying, hobby and the like.

Need

Improvement of the dwelling in qualitative terms with respect to social, emotional or market criteria.

Required Changes

Addition or replacement of fittings and furniture.  
 Provision for new equipment (creation of utility room).  
 Addition of bathroom or toilet (creation of box room).  
 Addition of space for books, equipment storage (box room).

Need

Re-arrangement through change of sub-division of the dwelling.

Changes Required

Alteration of the relationship of rooms or activities zones to each other through opening or closing off.  
 Creation of additional closed rooms like added children's room.  
 Alteration of partitions to change internal circulation or orientation of rooms to each other or to the outside (sun, light, view).

Need

Re-zoning of dwelling according to criteria like noise/quiet; public/private; children/adult; day/night.

Changes Required

Re-allocation of functions and activities to spaces.  
 Re-arrangement of movable wall partitions.  
 Modification of existing sub-divisions (through insulation, solid core doors, transparency, etc.)

Need

To fulfill aspirations pertaining to taste, conformity, compliance with tradition.

Changes Required

Everything which can be accomplished within building code allowances and without extension of the boundaries of the apartment. Open spaces like terraces, roof gardens and balconies might even make add-on possible.

When these criteria--which reflect the evidence accumulated in the previous data sections--are applied to the kinds and means of environmental adaptability discussed in Chapter I/B/1, the following elements for

housing flexibility can be usefully defined:

Element 1: Unspecialized Form

One form of adaptability of a dwelling can lie in its dominant design characteristics. Avoidance of too specialized room sizes and equipment, avoidance of functional and spatial separation between rooms and circulation space provides responsiveness of the dwelling to varying needs of subsequent occupants as well as to changing needs of the same occupant.

Element 2: Concentration of structure

The coincidence between the envelope of a dwelling and the load-bearing structure allows modification within this envelope. Total separation between boundary of the dwelling and structure allows growth of the dwelling beyond the original boundaries. The same holds true for supply with utilities and services.

Element 3: Additive structure

Within a dwelling, an unobstructed envelope allows add-ins. If the room height allows, additions can be employed in all three dimensions. If a dwelling is allowed to grow at the expense of an adjacent one, the growth can occur without necessarily impairing the organization of the dwelling before the growth.

Element 4: Variety

Variety should be provided within a house, not within a dwelling. This allows that a resident could choose the dwelling which comes closest to his needs. From then on, by applying strategies like re-arrangement, sub-division or switch of rooms, he may adjust his dwelling closer to his needs.

Variety within a dwelling should be the result of its adaptability, not the result of a pre-planned design concept.

Element 5: Overcapacity

Overcapacity underlies the proposal of adaptability put forward in this paper. The two single most important characteristics of Pessac were the open

floor plan and the generous room sizes and spaces like the open ground floor, terrace, roof garden. Only through built-in overcapacity is a useful allocation of changing activities to spaces, add-in and sub-division changes within a fixed envelope possible. Provision of outdoor private space which can be re-defined is the most crucial feature for allowing expansion in multi-dwelling structures.

#### Element 6: Disposability

A clear separation of elements which age or are rapidly outdated from the more permanent structure allow the application of the concept of disposability. Aspirations of taste, tradition, conformity and standard can be fulfilled if the features which most strongly express those aspirations are replaceable and exchangeable without impairing the more permanent structure of the house.

Disposability of the entire dwelling is a bad investment, poses ecological problems and is seen entirely unnecessary for the adaptability requirements as defined above.

#### Summary and Conclusion

This thesis has proceeded in three steps. First, concepts of environmental adaptability, the allocational role of adaptable housing for the supply-demand relationship, and the different perceptions of "housing" were discussed in Chapter I. Second, data pertaining to reasons for moving and data of observed alterations in housing have been presented and been discussed in Chapter II and III. Third, the conclusions derived from the overlap of the data were used to answer the questions posed, and were applied back to the framework for the purpose of defining some elements important for flexible housing, in Chapter IV.

It was found that there are reasons underlying moves which are so closely tied to the house itself and which in some cases are so dominant in the decision to move to justify and warrant housing flexibility as an alternative to moving. It was found that about 30% of intra-area migration which is overwhelmingly housing-related could be avoided if the resident--provided with housing flexibility--would choose to do so. From the data on moves it could be concluded that moving poses a hardship especially for families in the low-income category, large in size, belonging to a racial or ethnic minority and renting their shelter, since their options in the housing market are more limited than for others. They would be the prime beneficiaries of flexible housing. They are also those who primarily will have to find accomodation in multi-dwelling housing structures.

Therefore, the criteria underlying a model of flexible housing has to take into consideration the most apparent reasons behind the decision to move. But the elements defined to fulfill these criteria have to be applicable to the more modest and limiting conditions encountered in multi-dwelling housing. The elements proposed

account for functional as well as emotional or image-related housing needs and their accommodation under changed circumstances. Growth of the dwelling, therefore, is dealt with only peripherally. Instead of growth, overcapacity has been introduced into the equation. Rabeneck, in his overview of housing flexibility in various countries(10) contends that with increase of useable floor space by 10% above the accepted standard in England, considerable opportunities can be afforded for a model of flexibility as proposed in this thesis. This kind of housing flexibility can exist on its own. Nevertheless, it would be greatly improved by supportive measures which revolve around management and control. For both measures, the practices developed by HSB in Sweden could serve as an example.(11)

Apart from the rather small but--because of its social characteristics--significant amount of trade-offs rendered possible through housing flexibility between mobility and flexibility, adaptable housing has other advantages. First, it helps to reduce the housing-related frustrations encountered at a level below the threshold of the decision to move. If one takes mobility desires or mobility intentions into consideration as measure, then this constitutes a significant amount.



Second, it mitigates the problems which are associated with planning and building housing in an indeterminate market. It may help avoid the "social obsolescence" of a dwelling which often is encountered already upon the first occupation of it. Third, it provides a greater responsiveness to unpredictable demands in the future by representing at the outset a wider choice for "dwelling." And fourth--although far from establishing a politically and socially useful mode of user-participation and control--it allows the user to determine within wider boundaries than now possible his most immediate living space.

## References

### Chapter I

( 1 ) von Buttler, Florian: The Planning Process, or:  $Y=f(s,x,u)$ , Berlin-Kreuzberg, or Change?; unpublished term paper, Massachusetts Institute of Technology, Cambridge, spring 1973.

This paper describes the planning process of urban renewal in Kreuzberg in 1967/68. Although the focus of this paper is on the political mechanics and social implications of this case, some peripheral remarks about issues are included which are of interest to the topic of this thesis.

( 2 ) von Buttler, Florian; Dieker, Gert; and Lütjens, Robert: Art and Mass der Veränderbarkeit von Wohnungsspiegeln in Abhängigkeit von Erschliessungssystem and Wohnungstyp: Technische Universität Berlin, Fakultät für Architektur, 1970.

(Free translation: An Approach towards Quantification of Housing Flexibility).

( 3 ) The term 'problem space' here is used instead of the term 'frame work.' The three sections (I/B/1-3) do not make up the frame work of this paper, but are elements--among others--in a space in which the problem of residential mobility and housing flexibility and their possible trade-off qualities are seen to be located. Within this space, these three were selected as the most important ones for the discussion which follows. The term 'problem space' (Problemraum) was borrowed from philosophy where it is applied in similar fashion.

( 4 ) Lynch, Kevin: Environmental Adaptability, JAIP, Vol. XXIV, No. 1, pp.16-24.

For many of the ideas presented in this section, and for the organization of them, I am indebted to this paper by Kevin Lynch.

(5) Ibid., p.23

(6) Ibid., p.23-24.

(7) Change, here, refers both to a change in needs and a change in the physical organization to meet these needs. One kind of change of the physical organization is internal change which leaves the boundaries of the entity in which change occurs intact. Another kind of change is growth (expansion, contraction) which changes the boundaries. Change can, but need not result in growth. But growth always reflects change, either of the amount or degree or of the kind of activity in question. If change of activities or intensity of activities can be observed without a correspondent observation of growth, then one of three explanations are plausible: First, overcapacity at a cost that does not force a reduction of space (a loft as dwelling; a low density housing scheme); second, undercapacity (or, crowding) that cannot be eliminated either by reduction of activities or by growth of space; third, re-arrangement of the relationship between old activity and space; or new activities with the same space requirements.

(8) This is, of course, an extreme example. But it describes accurately the kind of flexibility which already exists. The combination of built-in overcapacity and property control which is particular to privately owned single-family houses allows--legally and structurally--the most unlimited and unspecified flexibility. It is, therefore, interesting to observe that exactly these qualities are applied to housing flexibility of multi-dwelling structures. (See Habraken, Pinney)

(9) Lynch, op.cit., p.17.

(10) Habraken, N. John: Supports: An Alternative to Mass Housing; Preager Publishers, New York-Washington D.C., 1972.

Habraken, N. John: Supports Responsibility and Possibilities; in Architectural Association Quarterly, Fall 1968/69, pp.25-31.

(11) Lynch, op.cit., p.18.

(12) Ibid., p.19.

(13) Ibid., p.21.

(14) Habraken distinguishes between 'dwelling' as a noun and 'dwelling' as a verb. The latter emphasizes the process-oriented nature of living in an environment like a house or an apartment. He believes that the functionalist approach in housing-design is based on the translation of activities into rigid spaces, and that the interaction between user and environment has been solidified into a state rather than a process. 'Dwelling' as a verb, therefore, is at the basis of what he calls 'the natural relationship.'

(15) Lynch, op.cit., p.22.

(16) Judge Sam Perry, U.S. District Court Seventh Circuit "Official Transcripts" 5444, in case brought to court by a Chicago contract buyer, 1972. U.S. District Court, Chicago. Quoted from: Mitchell, Maxine: Contractual Exploitation: A case study of the Contract Buyers League in Chicago. Unpublished thesis, Master of City Planning; Massachusetts Institute of Technology, Cambridge, Massachusetts, 1973, p.40.

(17) Proshensky, quoted from: Garbrecht, Johannes K.D.: Attitudinal Change Accompanying Intra-City Migration: unpublished Master of City Planning thesis, Massachusetts Institute of Technology, Cambridge, Mass., 1970, p.84.

(18) Boudon, Philippe: Lived-in Architecture: Le Corbusier's Pessac revisited; The MIT Press, Cambridge, Mass. 1972, p.43.

(19) The term "urban living" was coined by Shoukry T. Roweis in a course on "Economic Development, Technology, and Urbanization in Developing Countries," given at MIT in Fall 1972.

Urban living is made up of the following components:  
 LOCATION(physical infrastructure; access to social services; neighborhood externalities; access to work; access to private services; accessibility to desirable destinations);  
 LAND (original and indestructible powers of the land, including geology, view, climate, etc.); HOUSE (capital applied to the land including the structure, space, layout, aesthetics, etc.)

(20) Gans, Herbert: Some Notes on Physical Environment, Human Behavior, and their Relationship; Mime., disc. draft, MIT, September 1958, p.6.

Gans defines the effective environment as "...that version of the potential environment that is manifestly or latently adopted by users..."

(21) Merton, as quoted from: Wheaton, William (ed): Urban Housing; Free Press, New York, NY, 1966, p.22.

(22) George Kassinbaum, as quoted from: The Better Housing League: Housing and People; a survey, expert opinion on the relationship between housing and the human condition; Cincinnati, Ohio, 1971, p.15.

(23) Excerpt, Clifford Moller, in: The Better Housing League, op.cit., p.16.

(24) 'Die neuen Wohnviertel Fruges in Pessac (Bordeaux)', WERK, February 1927. The quotation was taken from: Boudon, Philippe: Lived-in Architecture: Le Corbusier's Pessac revisited; The MIT Press, Cambridge, Massachusetts, 1972.

(25) Heerwagen, D. R.: In Search of the Elusive Gismo: or Have You Seen my Ultimate Mechanical Goody Lately?; unpublished B.Arch. thesis, Massachusetts Institute of Technology, Cambridge, Massachusetts, 1971.

Heerwagen is primarily concerned with a hierarchy of needs that help him define requirements for a self-sufficient 'habitat'. Nevertheless, his analysis includes also needs which are closer to the needs discussed here. His definition reads: "Habitability might well be described as a relative quality of the living space which is dependent upon the purpose of man's presence, the type of performance he expects to achieve, and the time he will spend in the living space."

(26) Considering the choices on the housing market, the mistake is often made to take the total variety observed for the variety available to a prospective resident. But the market is sub-divided into submarket according to criteria which differ from resident to resident. The most pertinent subdivisions, however, are: Tenure, cost, location, discriminatory exclusiveness, size of accommodation, distance to job and vital services. If all these constraints are applied to a specific situation (resident), then the variety offered on the market is severely reduced. Chester Rapkin defines a submarket as "those elements in the housing market which are linked in a chain of substitution."

(27) If the floor plan of a given multi-dwelling housing structure can be subdivided over time into:  
a) two 4-room and one 6-room dwellings; b) two 4-room and two 2-room dwellings; c) one 3-room, one 4-room and one 7-room dwelling; d) four 3-room dwellings; 3) two

3-room and one 8-room dwellings; f) one 1-room, one 2-room, one 4-room, and one 6-room dwellings; then this housing structure is clearly able to accomodate a wider range of demand relating to size, number of rooms and dwelling configuration than a structure with a totally rigid layout.

(28) Imai, Randall M.: Litter in Open Spaces of Multi-Family Housing Sites; unpublished M.Arch.A.S. thesis, Massachusetts Institute of Technology, Cambridge, Massachusetts, 1973.

(29) Rossi, Peter H.: Why Families Move; Glencoe, Ill., Free Press, 1955.

The variable that is measured in the Rossi study is the migratory behavior of and its impact on the residents of four sample areas in Philadelphia, Pennsylvania, who follow specific characteristics. The measure (applied to areas, households, individuals) ranges from stability to extreme mobility and not only includes actual moves but also a comparison between attitudinal characteristics (desire to move, intention to move) and actual mobility behavior. The method employed is that of survey and statistical analysis.

Boudon, Philippe: Lived in Architecture: LeCorbusier's Pessac revisited:

The dependent variable in the Pessac study is the change observed from the original environment to the present environment, measured by the number, kinds and degrees of alterations of the general physical and especially housing-related environment. The independent variable is uncontrolled, which is to say that it is the total set of forces and circumstances--specifically the functional and symbolic housing needs--which brought about the change. The method of measuring applied is that of survey and observation.

## Chapter II

(1) In addition to these points, the comparison between the overall sample and the cases of East Boston allows some insight into that section of the apartment market that finds entrance into the Apartments for Rent section of the Boston Globe. From some own observations, it is obvious that in East Boston communication between 'supply' and 'demand' operates on a word-of-mouth and sign-in-the-window basis. This observation finds support in those sections of the Rossi study that deal with the sources of information used to find a new accomodation. In East Boston, remodelled and renovated apartments, on the one hand, and some new construction, on the other hand, have as their objective to attract renters from outside the area and therefore have to be advertised. The emphasis on proximity to public transportation, the higher score on apartment condition and extra amenities, the emphasis on management-related information as well as the lower scoring in the categories of availability and amount of rent which is born out by the table seem to suggest this explanation and seem to bear out the difficulty of East Boston to compete on a potentially city-wide market.

(2) The difficulty with the former data source lies with the fact that the 'mover' has to be located after the move and that he has to be brought to reconstruct the reasons which at the time of the move reflected dissatisfaction and his overall demand situation. A shift in the impact of a reason as well as rationalizations of certain reasons which lead to a move can frequently be observed. One such case will be presented in section D of this chapter. The difficult with the latter data source lies with the fact that desires and intentions to move do not necessarily result in mobility behavior.

(3) Rossi, op.cit.

(4) This resulted in a high status/high mobility; high status/low mobility; low status/high mobility; and low status/low mobility area. This segmentation, together with the relative homogeneity of the data with respect to other relevant parameters, secures the control of the independent variables which might act upon mobility behavior.

(5) Complaints are a measure of the kind and degree of dissatisfaction encountered by a resident. They point

to specific features that are underlying the dissatisfaction. They have also an accumulative effect on the intensity of prevalent mobility desires or intentions. Specifications are those criteria or specific features which are explicitly operative in the search for a new place. Attractions are those characteristics of a new place which either are the reason for a move (pull), or which make one alternative competitive with others in the search for new accomodation.

(6) Table 6.e establishes the connection between change of a need (here most often change in family size and/or composition) and the amount and intensity of resulting complaints (here most often with respect to space). Table 6.f shows the amount and intensity of complaints associated with the three major targets of complaints, space, neighborhood and cost.

#### e. Relation of Change and Complaint

	Primar.Compl.	Contr.Compl.	Ineffect.	100% equals
Change associated with complaint	71%	20%	9%	(35)
Complaint not involving change	32%	31%	37%	(45)

Source: Rossi: Why Families Move; Appendix Table, p.207.

#### f. Complaints Assessment Ratings

	Prim. Complaints (Impact)	Contr. Compl.	Ineffect. Compl.	Total Compl.
Space complaints	45%	8%	11%	64%
Neighborhood compl.	14%	8%	7%	29%
Cost complaints	12%	7%	13%	32%

Source: Rossi: Why Families Move; Table 8.3, p.139.

(7) If actual moves could not be observed, these two measures would form the basis on which mobility would have to be analyzed and predicted. Rossi--as a matter of fact--checks the observed mobility behavior against mobility desires and intentions as voiced by the interviewees. His calculation falls short only by 2% of the actual mobility exercised. This establishes the validity to consult both actual mobility and mobility desires/intentions as data basis for this inquiry. Table 7.a and 7.b show the data underlying the above argument.



7. Mobility Intentions/Desires

<u>Mobility Intentions</u>		<u>Mobility Desires</u>	
Expects to stay on	77%	Anxious to stay	36%
50-50 chance of moving	14%	Stay but not anxious	16%
Definitely moving	8%	Move but not anxious	23%
Don't know	1%	Anxious to move	25%
100% equals	(924)		(924)

<u>Mobility Intentions</u>	<u>Mobility Desires</u>			
	Anxious to stay	Stay but not anxious	Move but not anx.	Anxious to move
Plans to stay	97%	86%	82%	40%
50-50 chance of moving	2	12	15	33
Definitely moving	1	2	3	27
100% equals	(340)	(137)	(191)	(224)

Source: Rossi: Why Families Move; Table 6.1, p.101; Table 6.2, p.102

(8) Since very large families are most severely restricted in the housing market (especially when renter and of low income), resignation to the situation might decrease the 'objective' space pressure. This explanation suggests itself by comparing the lower score of complaints for families with four and more persons in 1-room to 2-and-a-half-room dwellings with the higher complaint score for the same family size in dwellings ranging from three to four rooms. The importance of space seems to be discontinuous over the family size in that the main differences in the complaint score occur between a one-person and a two-person, and between a two-person and a three-person household, whereas with larger household sizes, the complaint score seems to level off.

(9) Rabeneck, Andrew; Sheppard, David; and Peter Town: Housing Flexibility/Adaptability?, in: Architecture Design, 2/1974, pp.76-90.

In this article, which embodies the personal conclusions derived from a survey of European attempts at flexible housing, Rabeneck et.al warn of the danger which emanates from a housing flexibility that is grounded on similar tied need-specifications as those which underly the functionalist approach of the 'optimal' dwelling. They argue--in my view, convincingly--that the scope of built-in flexibility of a dwelling should not be derived from the same generalized behavioral criteria which lead architects to the design of the 'perfect-fit' dwelling. In other words, they do not consider the replacement of one statistically derived definition of 'needs' with another (this time generalizing the process of change of needs) a solution.

Chapter III

- (1) Boudon, op.cit.
- (2) Ibid., p.65 (Civil Engineer in discussion with Boudon on the concept of Pessac and its position in the field of architecture of housing).
- (3) Ibid., p.35 (Le Corbusier to Henry Frugés about standardization, in 1925).
- (4) Ibid., p.87 (Pessac resident M.L.)
- (5) Ibid., p.98 (Pessac resident, case OF83).
- (6) Ibid., p.56 (Pessac resident, case F10)
- (7) Ibid., p.81 (Pessac resident, case OF35).
- (8) Ibid., p.85 (Pessac resident, case OF36).
- (9) Ibid., p.112 (Pessac resident, case M22).
- (10) Ibid., p.117 (Pessac resident, case M3).
- (11) Ibid., p.114 (Pessac resident, M20).
- (12) Ibid., p.117 (Pessac resident, case M3).
- (13) Ibid., p.118 (Pessac resident, case F15).
- (14) Ibid., p.120 (Pessac resident, case F6).
- (15) Ibid., p.108 (Pessac resident, case M8).
- (16) Ibid., p.114 (Pessac resident, case F10).
- (17) Ibid., p.115 (Pessac resident, case M20).
- (18) Ibid., p.116 (Pessac resident, case M22).
- (19) Ibid., p.117 (Pessac resident, case M1).
- (20) Ibid., p.117 (Pessac resident, case M3).
- (21) Ibid., p.126 (Pessac resident, case M8).
- (22) Ibid., p.126 (Pessac resident, case M8).

(23) Hans Harms, in: Turner, John C.; Fichter, Robert (ed): The Freedom to Build; MacMillan Company, New York, NY, 1972.

The question of control or autonomy is of great importance in the discussion of strategies of user participation and involvement. The problem is whether representative democratic modes of participation of the user do not neglect the inequitable distribution of power and control particular to the western democracies. In a society like the US, autonomy has been equated with property and ownership. Socialist societies try to define the question of autonomy of the individual without the basis of private ownership. Harms uses the term in the following way: "Autonomy, therefore, entails the ability to enter into reciprocal relationships, to exercise both control over essential life needs and discretion in the trade-offs which establish priorities. Autonomy, in sum, is synonymous with substantial freedom of action." In both the Rossi study and the Pessac study, perceived or actual autonomy is closely related to tenure, which is to say to ownership or non-ownership of the house/dwelling.

#### Chapter IV

(1) de Carlo, Gaiancarlo: Legitimizing Architecture; in: (Dutch) Forum, Vol.XXIII, No.I, 1972, pp.8-20.

(2) US Public Housing Administration, April 1958: Mobility and Motivation: Survey of Families Moving from Low Rent Housing.

(3) Habraken, N. John: Supports: An Alternative to Mass Housing; Praeger Publishers, New York-Washington D.C., 1972.

(4) Ibid., p.21.

(5) Pinney, Neil J.: Toward Participatory Dwelling Design: Process and Product; Massachusetts Institute of Technology, Department of Architecture and Planning, Community Projects Laboratory; MIT, Cambridge, Massachusetts, 1972.

(6) von Buttlar, Florian, et.al.; op.cit.

(7) Andrew Rabeneck, et.al.: Housing Flexibility; in: Architectural Design, 11, 1973, pp.698-727.

The variation of different dwelling sizes on one floor level was shown in the English example of the PSSHAK project in section I/B/3. One floor level could upon occupation be sub-divided into dwelling sizes ranging from 1-room to 7-room dwellings according to the development of demand.

Also, as Buttlar et.al. (see footnote above) have documented, the useful combinatory possibilities of sizes revolve around the average of all dwelling sizes located in a house, or on one floor, respectively. Extremely large units will have to be balanced with several small units if the ration of number-of-rooms to number-of-dwelling units shall be constant; which it has to be if the number of total units is not changed either through growth or contraction of the building envelope.

(8) Beinart, Julian: Architektur des Mitmachens; in: Baumeister, Munich, June 1968.  
Beinart, Julian: Government-built Cities and People-made Places; in: The Growth of Cities, London 1972.

Beinart observed the changes in Western Native Township which over generations had been made in this settlement of single-family houses. The houses, built by the government, were rented or sold to low-income black people for whom a housing market in the city of Johannesburg, South Africa did not exist. The changes observed ranged from symbolic paintings and signs on the facade and fences of the house to functional alterations like add-on and add-in. It was observed that renters spend the same amount--if not more--of their income on these alterations than did owners. The example of WNT and--to a more limited degree--also of Pessac point to the possibilities of housing adaptability in low density environments. Especially WNT and the squatter developments of the Southern Mediterranean and Middle and South America exemplify an approach to housing adaptability which has been given little attention in this thesis, if any at all. The analysis put forward in this paper, and the conclusions derived from it for a model of housing flexibility focus

narrowly on a context which is characteristic of the industrial countries in Europe and some urban centers in the US. High density environments and life in multi-story housing structures determine means of housing flexibility fundamentally different from those found in the squatter settlements.

(9) It has been argued throughout this thesis that its primary purpose was not to correlate needs with housing flexibility. Although--at the outset--it was attempted to relate a matrix of needs and its internal changes to housing needs and the reasons for dissatisfaction with housing, this attempt did not prove useful on two grounds. First, the data available did not allow the construction of such intricate and specific relationship; and second, the construction of such a matrix of needs with its underlying behavioral generalizations was seen to limit a model of housing flexibility more than it would have been helpful in defining it. By defining desires with respect to housing in more general terms (and these desires could be derived from data on moves and alterations), flexibility is seen as a means to provide options instead of a means which anticipates (and pre-plans) sequences of specific needs and their changes over time.

(10) Rabeneck, Andrew, et.al: op. cit.

This article offers an excellent overview with regard to objectives, problems, and implementation of flexible/adaptable housing in Sweden, Netherlands, England, Germany, France, and Switzerland.

(11) Ibid., pp.708-716.

Architects and technical personnel assist the resident in working out and implementing alterations deemed necessary or desirable within the dwelling. Upon occupation of the dwelling, the first arrangement is done according to the specifications of the resident and without extra charge. Subsequent changes are carried out by the resident himself or, where assistance is required, by the permanent technical staff of the housing agency HSB. The capital investment necessary for the alterations is projected onto the monthly rent and stretched over a considerable period of time. Through this arrangement, financial hardship is avoided, the risk of rapid turnover by residents decreased to the benefit of the agency, and the control which can be exercised by a resident over his own dwelling is considerably increased without providing ownership to everybody.

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Appendix

Illustrations of Flexible Housing



**FIGURE 13: Life Cycle and Space Needs**

This diagram shows the growth of a family over a 50 year time span. Each box represents the space requirements which are added or subtracted according to the respective size of the family.  
(Source: Pinney)

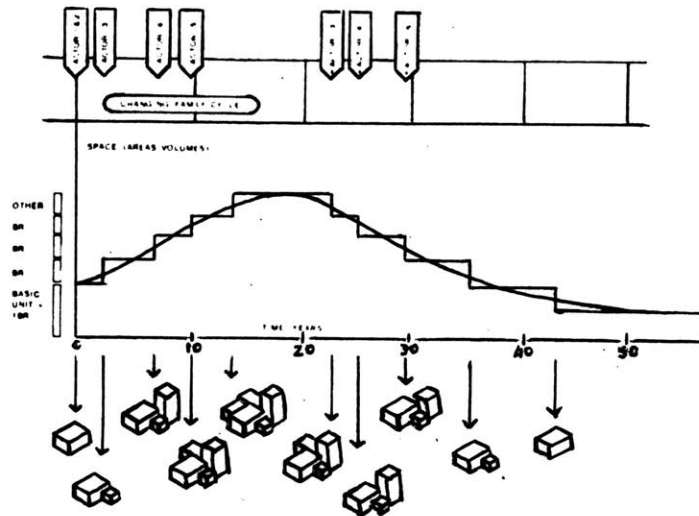
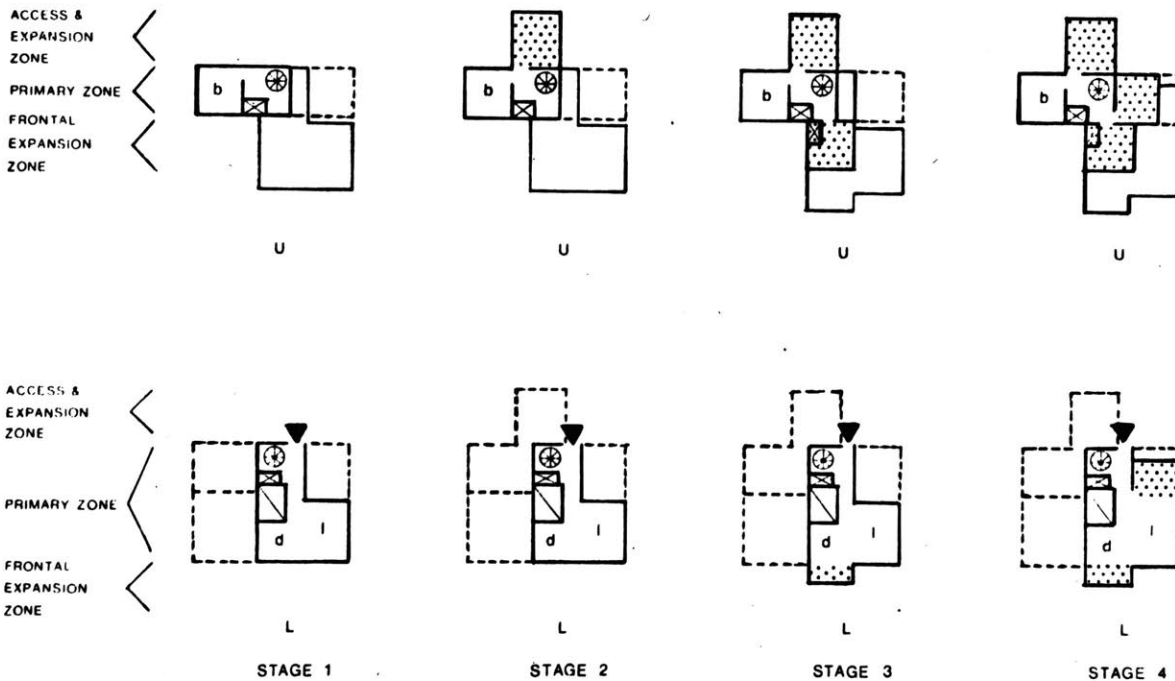


Figure 4  
Life Cycle and Changing Space Needs

**FIGURE 14: Growth of a dwelling within Zoned Area**  
(Source: Pinney)





**FIGURE 17: Internal Layout Possibilities**  
(Development of a dwelling over time)

(Source:AD/2/74:Rabeneck,et. al./Project in Orminge,Sweden)

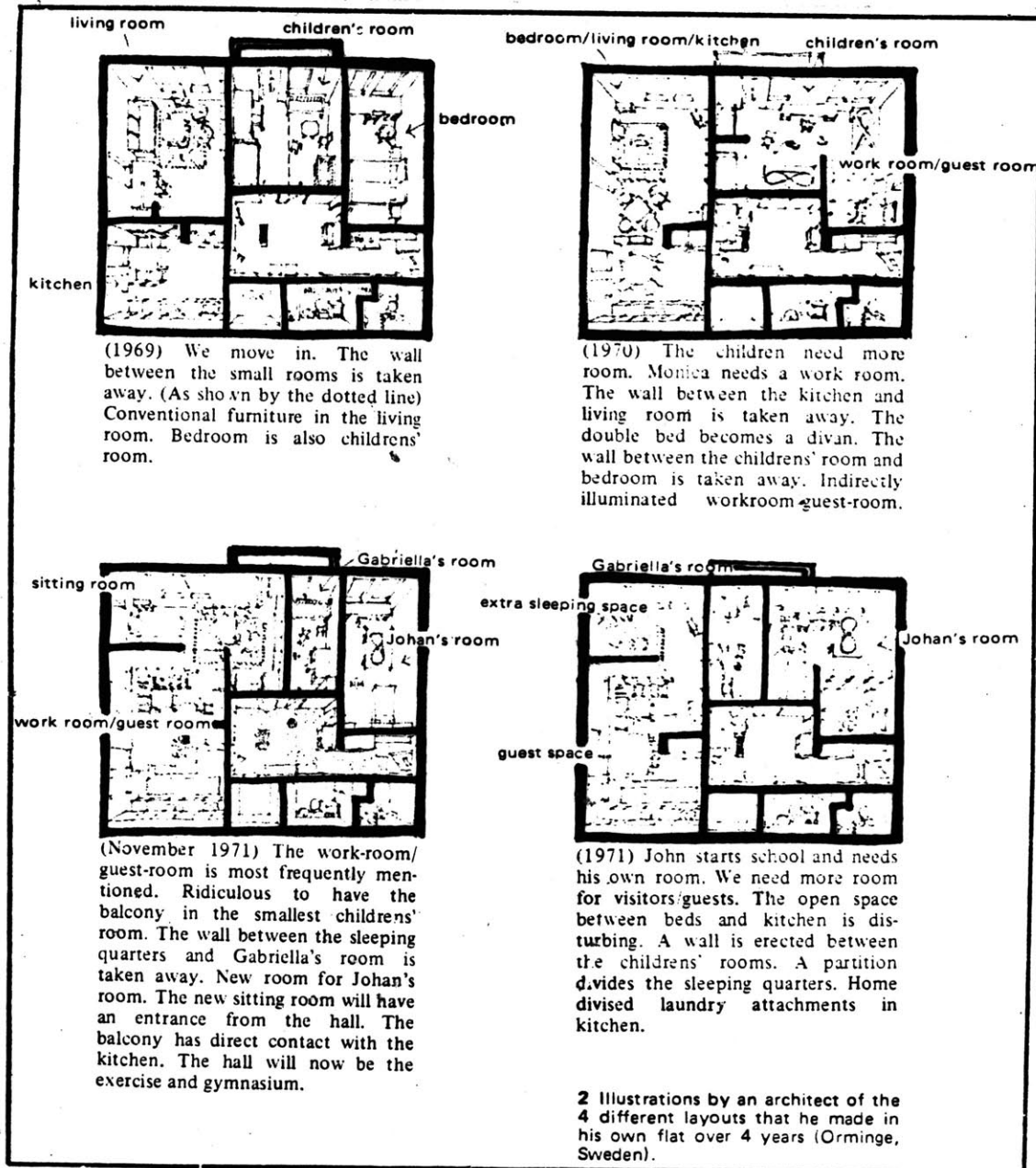
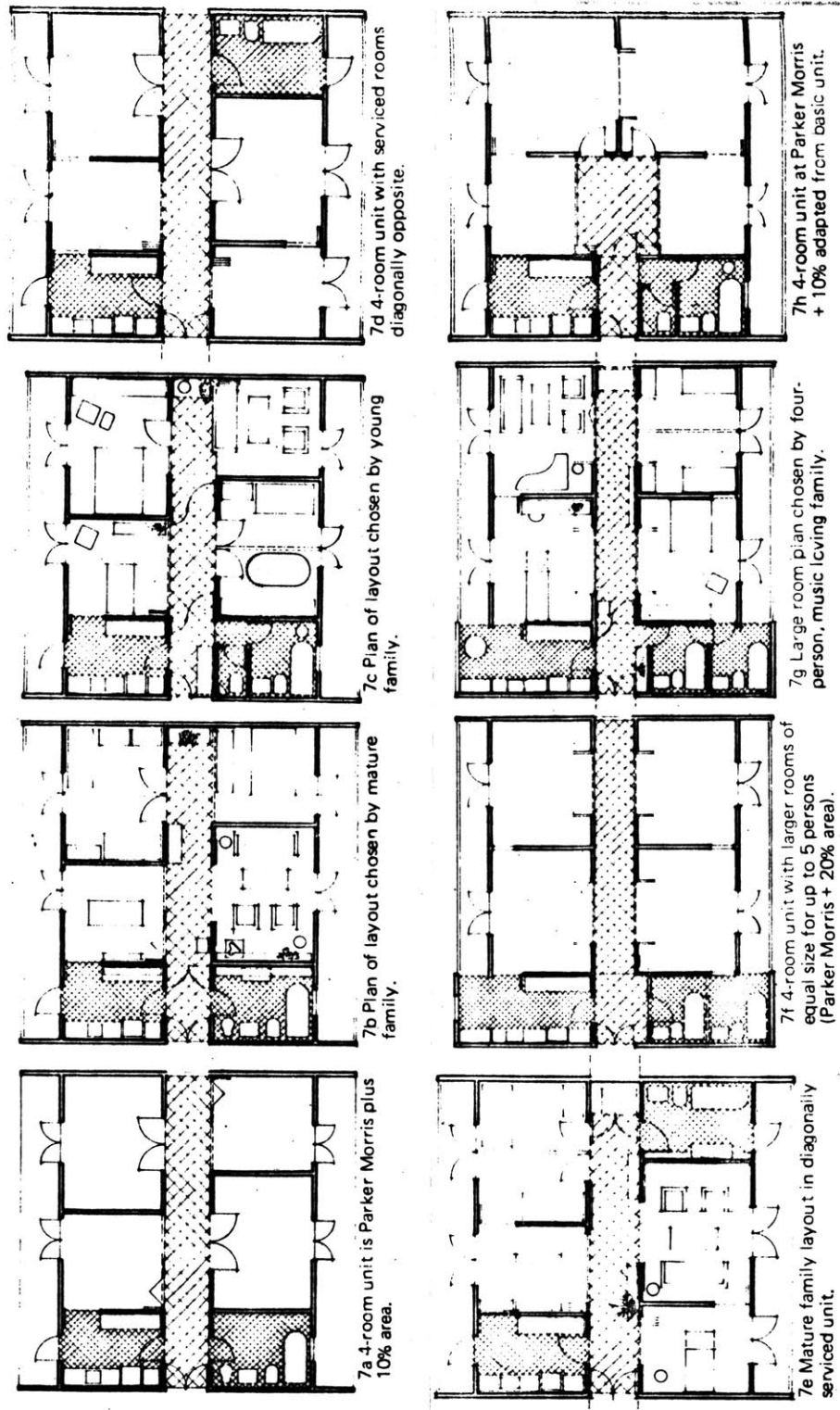


FIGURE 18: Layout Suggestion for Dwelling/Parker Morris+20% Floor-Area

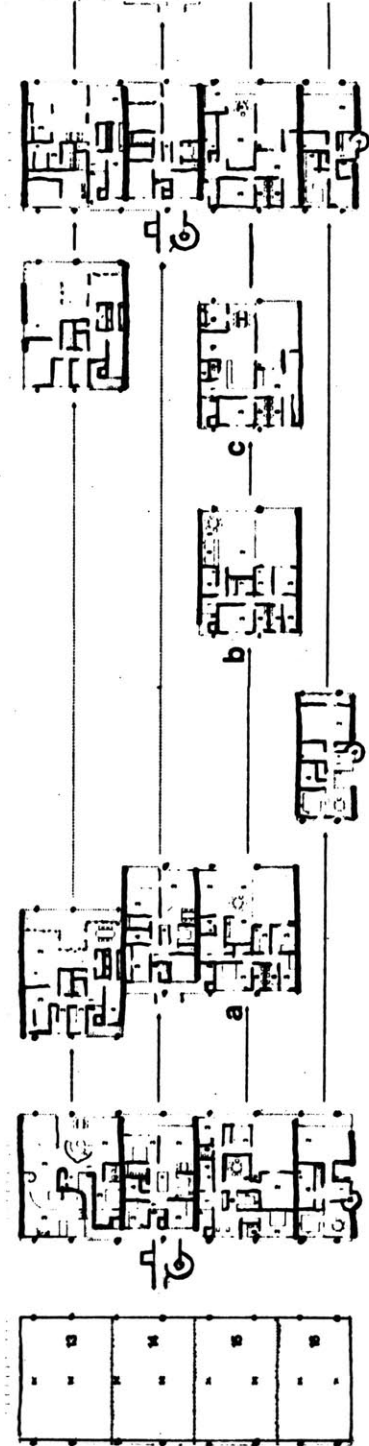
(Source: AD/2/74: Rabeneck, et. al.)



**FIGURE 19: Project Planning over time (Switzerland)**

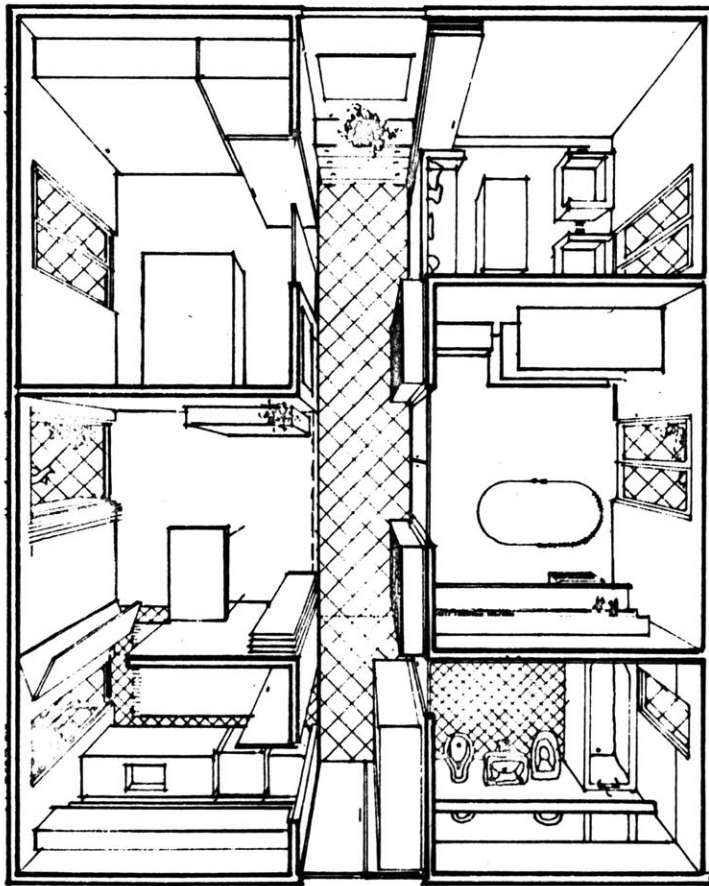
(Source: AD/11/73, Rabeneck, et. al.)

2 System 4D. Development of the plan at Zug. (B & W 1/73)



**FIGURE 20: Axionometrics of Figure 18**

(Source: AD/2/74, Rabeneck, et. al.)



5. 4-room unit: layout chosen by young family to provide parent/ children zoning.