NATIONAL BUREAU OF STANDARDS REPORT

VOLUME THREE
SUPPLEMENTARY
DOCUMENTS

THE PERFORMANCE CONCEPT:

A STUDY OF ITS APPLICATION TO HOUSING

prepared by

The Institute for Applied Technology

for the

Department of Housing and Urban Development

NBS

U.S. DEPARTMENT OF COMMERCE

NATIONAL BUREAU OF STANDARDS

REPORT NUMBER 9851

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THE PERFORMANCE CONCEPT

A Study of Its Application to Housing

VOLUME THREE

SUPPLEMENTARY DOCUMENTS

Prepared under contract for

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Introduction

This report is Volume Three of a three part study done for the Department of Housing and Urban Development by the Institute for Applied Technology of the National Bureau of Standards. The basic report, "The Performance Concept; a study of its application to housing" (NBS No. 9849) constitutes Volume One. Appendices A through E developed as individual studies and are referred to in Volume I, but are reported in their entirety in Volume Two (NBS No. 9850).

This volume contains supplementary documentation as received from individuals and organizations under contract to the Bureau of Standards for specific input in their area of expertise. Since this documentation has neither been edited nor commented on by the Bureau, the publication, herein, does not imply recommendation or endorsement by the National Bureau of Standards.

THE PERFORMANCE CONCEPT

A Study of Its Application to Housing

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VOLUME III

SUPPLEMENTARY DOCUMENTS

THE AMERICAN HOUSING PRODUCTION SYSTEM
AN EXPLORATION OF INHIBITIONS AND CORRECTIONS
LINES OF RESEARCH
AND
USE OF PERFORMANCE STANDARDS

-oOo-

Part of a Study on Performance Standards Development
for Low-Cost Housing

-oOo-

Contract with the National Bureau of Standards,
Department of Commerce
With
The Department of Housing and Urban Development

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Community Planning Consultant

-oOo-

April, 1968

Philadelphia, Penna.

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GENERAL HOUSING RESEARCH NEEDED AS A BASIS
FOR EVALUATING USE OF PERFORMANCE STANDARDS

PREFACE

This outline was prepared as part of a team effort on the way to a complex proposal for research in regard to the housing industry, its performance in the economic, social and physical dimensions. The request for such a proposal placed special emphasis on low and moderate income families, conditions, technology and procedures to meet their needs.

This test is laid out in outline form to stimulate further the thought, research, and broad action to raise the housing standards of all families.

The writer, participating in the early stages of this study, was asked to keep in mind the identification of the blockades, estimate of their costs, means of removal of inhibitions and costs of such removal. The exact charge and section given to this author included the following:

1. To describe the present system for procuring, conveying and consuming housing.

2. Identify all present inhibitions to cost reduction or increased benefits in this system.

3. Develop and apply a methodology to approximate the cost to the present system due to the inhibitions identified in 2 above.

4. Describe strategies for removal of these inhibitions using existing tools. Postulate other methods of inhibition removal where tools do not exist.

5. Speculate on cost reduction and increased benefits in a system where inhibitions have been removed.

The total request for a research proposal is duplicated and follows this page*. It can therefore be clearly seen that this organized description of housing production is chiefly an introduction to part of a scheme for research.

It is possible that the questions asked are wrong, or that the premises upon which they are based are inadequate. Perhaps the time and tempo of change directs a somewhat different set of questions. However, those which are asked are listed in the HUD request of January to the National Bureau of Standards. This introduction organization of material is therefore largely addressed to those questions.

A range of research programs are listed in the last section. It is hoped that this beginning will be valuable to the nation and its urban hang-up.

Drayton S. Bryant
Community Planning Consultant

* See Volume One.

INTRODUCTION

Before evaluating the usefulness of a performance-based system to be applied to the American housing scene, in particular "low-cost housing", it is advisable to outline an approach, certain basic factors and ideas which will lead up to the construction of a performance-based system. At least the following steps appear to be a necessary introduction to the construction of such a system.

1. A description of the existing housing production, use, and replacement system.

2. A description of major factors in the system, particularly the inhibiting ones.

3. Establishment of goals for the society as a whole, effectively related to the needs of users as to quantity, quality, price and future of housing.

4. Means of measurement of actual production and factors as well as projected elements.

5. The use of performance standards to estimate the degree to which the society as a whole and each of the parts in the housing system are falling short of the projected goals or needs.

Out of these five parts of an evaluation, should rise at least the following steps:

6. A ranking of the effects of the deficits.

7. A listing of alternative methods of corrections.

8. Estimated cost of corrections and effects upon other factors.

9. A choosing of actions and estimate of expected results.

10. A report on both expected and unexpected results.

11. A feed back into the housing system which would effect actions already chosen and lead to initiative for new actions to be developed and tested.

This report is only a part of a much larger effort to organize the approach to such an evaluation of the use of performance standards and measurements as a tool in understanding present housing systems and developing of more effective ones. Presented here is an outline of the system in brief form. Major elements of inhibition

to the effective production and use of housing are then listed, but not yet ranked as to effects and costs.

A third section lists possible corrections, but these are not yet ranked as to the estimated results and costs.

Some lines of general research are described herein as they are felt to be basic to establishment and use of performance standards.

It is realized that some of these research questions go beyond the narrowest interpretation of the use of "performance" but it is felt that these general research areas are essential to have on hand in order to construct the goals, measurements and degree to which actual results fall short of meeting the goals. Then there are some observations on relevant performance standards, arranged in relation to the skeleton outline of the production system. It is hoped that not only does this report speak to the specific questions addressed to the writer, but has aided in creating a bridge forward to the next steps in actual construction and use of performance standards, and a turning of the spot light of research and evaluation upon the field of action.

A - IDEA ORIGINATION (Will to Act)

Awareness of need and opportunity for various types of new housing, or major improvements

Decision to act by different types of initiators

Estimate of need and market in the neighborhood or region

Estimate of ability of initiator to carry out tasks

Estimate of needs of initiator to fulfill program, financial, staff, time factors

Types of Initiators, Types of Actions

Individual - for himself, for sale or rent

Builder of multiples - single houses
- apartments to sell or hold

Service Group - Neighborhood organization
Institutional
Housing Specialists (non-profit corporations)

Government - Local - Special agency, Authority
Mayor
City Council

State - Division or Department

National - HUD - regional
Military, shipyards, space,
TVA
(Fomerly P.W.A., Greenbelt, Farm Security Administration)
Farmers Home Administration
Special Agencies - Appalachian Commission

Investment - (other than builder) Quick speculation
Tax shelter through depreciation
Long term capital gains, rate of income taxation
Long term investment return

I Individual

1. Lack or motivation (nothing need be done, nothing can be done, I can't do anything)

2. Lack of awareness of choices in the usual market place or by innovation.

3. Lack of down payment and closing costs - immediate financial limit

4. Lack of skill in design and construction

5. Lack of understanding of finance which may actually be available

II Service Group

6. Fear of liability to group with other function, such as church, union, fraternal

7. Feeling of professionals about non-business groups as incompetent

8. Distrust of professionals by the group, "packagers," promoters, "suede-shoe" salesmen.

9. Lack of competent, responsible and honest professionals.

10. Uncertainty as to or lack of credit and cash by group, to use as seed money toward financial commitment

III Entrepreneur

11. Lack or seed money for site, plans, preliminary work

12. High cost of construction finance, "points," fees

13. Inadequacy of permanent mortgage, high interest, short term, large down payment

14. Marketing difficulties, delays, risk

15. Rumors and facts of high land prices

16. Long start-up time, due to zoning, codes, design, finance (especially government).

IV. Government

17. Local - Lack of knowledge or response to local needs, rigidity, special interest, indifference,

so that available programs are not sought, nor is innovation undertaken

18. State - Generally weak role of state government, or traditional disinterest in urban affairs including housing. Poor administration, low salaries, inertia, lack of concept of possible role.

19. National - Value system with low priority for housing and community life, lack of knowledge or avoidance of social realities, difficulties in innovation or moving ahead of slowest common denominator. Political or token response rather than at scale of problem. Low status of service professions, weakness of consensus administration which does not function as leadership.

V Financial Investment

20. Quick speculation in land and buildings serves as a constipating or retarding factor to development or improvement, in addition to other functions of adjusting to rising markets. Aids in manufacture of slums, obstructs economical or rational new development and redevelopment in some cases.

21. The possibility for income tax shelter through depreciation allowances introduces non-housing or non-use oriented motivations in the housing market which often tend to inflate a housing market already under pressure for increasing costs. In some cases, it may not increase supply, in others tend to over-inflate and over-extend a boom in new construction, causing further upward pressure on costs.

22. Opportunities to take capital gains rate of taxation on residential properties sold at a profit, rather than tax rate on earned income, often increases inflationary pressures on costs, particularly at a time of general inflation, speculation and rising profits for the strongest elements in the economy.

23. The desire for long-term investment returns may encourage better planning construction, amenities and management in many instances. Inhibitions against this generally positive possibility, include rapid mobility of population, especially related to loss of morale and positive sense of community, obsolescence of housing types, intrusion of undesirable environmental factors such

as smoke, fumes and smog, noise, physical or social danger, excessive traffic.

A-Correction-1

I Individual

1. Education on advantages of ownership on credit, mortgages, taxes, inflation, use of self-help, power of innovation.

2. Distribution of facts on choices, especially to Negroes, special personnel of employer staffs, welfare and information offices, change of pattern in housing and its finance.

3. Service organizations to lend half of down payment and closing costs, "Home Savings Unions", Credit Unions, Caisses Populaires (Quebec under consumer control)

4. Printed materials, adult education, urban and neighborhood counselors similar to County Farm Agents, Farmers Home Administration.

5. Adult education on interest, taxes, simple bookkeeping, mortgages, depreciation, capital gains. Consumer action-information programs to obtain improvement in mortgage financing, banking pools for sharing higher risks.

II Service Group

6. Education, printed materials, emphasis on non-liability of sponsors for separate corporations, to Directors, Officers, Counsel to non-profit service institutions, religious, labor, consumer, civic, fraternal groups.

7. Charts and outlines, step by step on planning finance, construction and operation.

8. Clear description of division of responsibilities among voluntary non-paid directors, officers, staff and professionals under contract.

9. Encouragement, definition, standards, organization, workshops for training professionals serving I, II and III to develop and increase the supply.

"Thus conscience doth make cowards of
us all and thus the native hue of
resolution is sicklied o'er with the
pale cast of thought."

10. Knowledge of means of raising cash and credit for service purposes, regular and broad contacts with lending institutions.

III Entrepreneur

11. Study and development of sources of seed money, commercial, government (partial) and limited dividend or non-profit.

12. Study of flow and cost of construction money and support for initiators.

13. Clear reporting on all sources of mortgage money, action programs to encourage or direct more flow of capital into housing and at more favorable costs for capital.

14. Reporting on methods of successful marketing and constant study of need, growth and markets.

15. Publication of all land transactions, or at least statistical series by area, size, type, zoning of parcels.

16. Record of actual lapsed times and analysis with evaluation. Same service to home builders as to farmers.

IV Government

17. Local improved service to, personal contact, orientation, training and informational materials on responsibilities, programs, opportunities and methods, including innovation.

18. State improving definition of regional and catalytic leadership role of state governments, particularly in regard to large urban areas. Increased return of tax income or tax leases to state governments by the federal. Improved communication with the electorate, local governments, leading to increased interest and support for appropriate programs, budgets, personnel and administration.

19. National-Pervasive but inadequate value systems are generally changed by necessary response to accelerating physical and social changes, but may be helped by exercise of one of the key functions of leadership, creative response to needs, with concepts, communication, pilot actions and a broad range of involvements. Emphasis must be placed on the scale of each problem and hence appropriate scale of actions by all parties. There must be constant consideration and actions therefrom as to the nature of generative leadership in our society and time.

V Financial Investment

20. Land banking by public agencies may be studied and used as a counter force to the possible constipation of excessive speculation or holding of land because of other economic considerations, short and long term. The improvement and release of some proportion of new land, or old scattered parcels or assemblages, may be a useful tool to assist competitive enterprise to function more competitively and in the interest of community, its housing and livability.

21. Depreciation allowances as related to income taxation and its effect upon housing is worthy of detailed study from the point of view of the housing supply and quality, especially maintenance. What changes in allowable depreciation rates might most improve the quantity, cost and quality of the housing stock?

22. The effect of favorable tax rates on long term (relatively) capital gains should be examined in detail to estimate its effects upon housing stock. The more favorable capital gains rates should help to stimulate the flow of capital into housing work. However, this may have little effect upon low-rent housing quantity or quality because of possible higher risks.

23. Factors should be examined and evaluated which will aid long-term investment and its more positive motives in housing. Action programs to stabilize neighborhoods to an average rate of replacement of families, out-migration, and protection from physical destruction or sharp

23. ---lowering of real desirability, should be related to the findings about factors encouraging long-term investment, physical maintenance and generative community morale.

A-Research

NOTES TOWARD DEVELOPMENT AND USE OF A METHODOLOGY TO APPROXIMATE THE COST OF INHIBITIONS IN HOUSING

The cost lies in an inadequate total supply of housing, hitting hardest those of low income. How are costs of bad housing to be separated from costs of poverty, costs of illness, accident, death, crime associated with bad housing, costs of failure of adequate personality development, family, social growth and adjustment? There are too many variables here which must be included in total cost of under-development. Lack of idea origination or will to initiate is part of a value system which must be changed in response to the demands of life. Measure of different groups would include too many variables. Study of why individuals become subcontractors or general contractors or other initiators would not be profitable in the ranking of possible research.

Evaluation of non-profit or service organizations that did, did not, or took up housing idea and dropped it, would be useful on a sample of metro areas, in obstacles to getting started, inducements, sources of ideas. Sample of 100 non-profit groups that did begin housing work, 100 that did not in the same area would be useful.

A-Performance-1

The performance measure indicated at the outset with initiative to undertake to build or otherwise increase and improve the supply of housing, rest with the five types of initiation listed. The housing need against which the performance should be measured must be estimated from a variety of types of information, including dilapidation, over crowding, family income, the quantity of land used and new construction started in recent years.

The number of individuals building or contracting to build their own houses is a measure of the individual response, along with the percent of new houses started which originate in this manner. Indication as to the response of builders will include the number of home builders, the average production per year, the number of permits applied for in each of recent years and the results. Evaluating the role of

service groups in housing is more difficult, yet it is clear that in some areas various non-profit groups have initiated various housing programs, those titled 221(d)3 and 202, rehabilitation and other special programs.

The initiative of local government includes its general level of planning work in regard to residential land, the initiatives taken to encourage the meeting of housing needs and the movement to prepare land with streets and utilities for builder development. The degree of initiative by private investment sources, short or long term, will include the number of new efforts started, the initiative taken to prepare land for construction and the length of time taken to prepare the land in advance. In some communities the lending institution officials are forward looking and active, cooperating with their builders and all sorts of initiators, whereas in others there is still obsession with the mythology of 1931.

The establishment of proper goals and measurements for performance is difficult in this area of response to need, but is felt to be possible and very much worth doing as a part of the general use of the performance tool.

B-PRELIMINARY PROGRAM SELECTION

I Types of Actions in Housing and Related Development

1. Investment - long and short, land or buildings
2. Construction - building or land development only
3. Enlargement of existing structure on same site
4. Conversion (and de-conversion)
5. Rehabilitation - Cosmetic, Appliance and Total Modernization
6. Abandonment and Boarding up
7. Demolition
8. Substitution of uses other than residential

II Review of Financing Means

Conventional, Government, Cash
Construction (temporary) and permanent (take-out)

III Review of Federal Program Requirements

For application, planning, development, operation, financing, and length of whole procedure, with costs

IV Productivity of Alternate Uses

Developers' time applied to course under study and benefits of alternate use of time.

I Types of Actions in Housing and Related Development (HARD)

1. Investment - Drastic changes and irregularities in flow and cost of capital for HARD due to factors in and outside of housing
2. Construction - Time, cost, personnel, land, capital, uncertainty

3. Enlargement on existing site. A minor factor in the total Related to zoning codes and other inhibitors for investment and construction except farmers who already own land.

4. Conversion (and de-conversion) Over-use in declining neighborhoods makes this doubtful except by self-owned, quick return capital. Chief problems are design (adequate standards) and capital, which is often self-generated out of operations.

5. Rehabilitation - Withdrawal of all mortgage funds from older neighborhoods. Lack of plan for blocks and neighborhoods, or total uncertainty. Blighting non-residential uses, inadequate zoning, inadequate code enforcement.

6. Abandonment - Inhibitors to proper occupancy and maintenance are weak or distant management. lack of communication with residents, lack of proper maintenance leading to further alienation of residents. Lack of adequate code enforcement during occupancy.

7. Demolition (when advisable) Difficulty in obtaining title or locating owner. Lengthy, cumbersome legal procedure. Lack of local funds to take advantage of opportunities as they arise, which is far cheaper than public condemnation and forced relocation at one time.

8. Substitution of other uses for residential Homes are converted to stores, storage, often illegally in older neighborhoods. While such substitution may be profitable, it is also a source of blight and diminishes the housing supply.

I Types of Actions in Housing and Related Development

1. Investment - Obtain and distribute facts on capital flow and costs of national fiscal policy, Federal Reserve Board regulation of banks; chosen policy for allocation of capital to HARD announced in advance for at least a two year period, by lending institutions and government agencies

2. Construction - The heart of the matter. National, state and local policies determined, stated, published and aided. Publication of current facts at all levels, especially metropolitan by an inter-agency funded statistics, research and publication body.

3. Enlargement - Publication and competent technical advice on how to get better use of existing space, make improvements, and in some cases enlargement (as in FHA-insured Home improvement loans).

4. Conversion and (de-conversion) Publication of standards and desirable circumstances for proper conversion (obsolete buildings) due to change in local market.

5. Rehabilitation - Combined operation in older neighborhoods to synthesize, integrate and relate a multi-faceted program to housing improvement.
   a) Analysis and map of neighborhood conditions
   b) Plan for action in space and time sequence
   c) Review and change of zoning as needed
   d) Plan for review of, control, or elimination of harmful uses
   e) Obtain flow or guarantee of availability of capital, government of commercial (allocated), preferably both for a definite period such as two to four years
   f) Follow with concentrated code enforcement, well administered, good communication with owners and tenants
   g) Increase taxes on improved houses only as area economic conditions improve, i.e., income
   h) Develop means of enforcing safety and appearance standards on harmful deviations

6. Abandonment - Constant attention by city inspectors to require closing and maintenance. Proper maintenance by owner before abandonment, housing code enforcement, tenant communication and education in occupancy; competent neighborhood management, available social services to disturbed families (doorway management, Octavia Hill System with weekly rental collections at each dwelling)

7. Demolition (When advisable) Review procedures for requiring demolition, state and local laws for enforcement. Use a revolving fund for demolition where advisable and possible and make the cost a lien against the land. Advance or scattered demolition under law is more economical than renewal acquisition procedures.

8. Substitution - Where undesirable, it can be retarded or prevented by an active neighborhood association with leadership and a special committee alert to zoning procedures, law and harmful and illegal changes in use. This is more a method for blight inhibition than an important factor in the housing supply.

B-Research

Sample interview of a group of large and small home builders, cross-section of redevelopment authorities (with and without land for housing or non-profit corporations), would be useful. Test knowledge of varied program types of initiators, factors in choice, sources of knowledge. Interview government agencies for extent of furnishing wide range of program information.

B-Performance

The question of performance here relates to knowledge of the choice of housing programs by the variety of initiators and operators. Against the full list of federally and state aided housing programs, there can be a measurement as to the knowledge by officials of lending institutions, a sample of builders, officials of local government, and leaders of service groups in and out of housing. Where gaps in information are found so that the usual initiators really do not have full information for optimum selection, there can be an evaluation as to the best means of correction, including the distribution of printed materials, conferences and workshops, knowledge of laws in the housing field. Where there is good local information, how did it arrive? If there is not sufficient information or its quality is ragged with many omissions, what are the best ways to get through to the local decision makers?

C-POLICY DETERMINATION

Need and market to be served

Area and location target

Size of total program, and various special parts by financing, age, income groups

Physical type distribution of structures

Economic levels resulting from site, construction design, financing programs, and type of operation (quick extraction, long investment, cooperative or non-profit)

Examples

Individual - Size of house, area, cost, down payment

Service - Queen Village, Inc. in Philadelphia selects 221(d)3, 221(h), 221(d)2, for a broad range program, but there is objection by higher income and status group.

Builder - Size based on land, price level on neighborhood market

Gov't. - Area need, but political unit and neighborhood approval - often required or advisable - one-slice projects are the usual product, with sometimes artificial and harmful segregation by family size, income or age.

General Complexity of Programs

Lack of simple guides and comparisons of all major choices for types, financing, administration, operation

Specialists in commercial or government agencies familiar with only one or partial programs

Lack of professional advisors experienced in a wide range of programs

Result frequently based on choice of a site, building type, and financing out of habit, chance or at best partial knowledge.

Examples

Individual: Builds a house on a lot because a) it is available; b) near a relative; c) advice by a builder who already owns a lot; d) an architect; e) a friend

Service Group: a) A chairman, or lawyer makes choices, as to what the group shall be exposed to; b) An individual owns a piece of land on which he wants to profit; c) An architect guides the choice; d) A consultant may steer a group toward land, architect, builder and program from which he will most benefit.

Builder: Acquires land by chance information, already determining program choices by location, zoning, area trends, financing choices; zoning, planning, political decisions beyond the scope of the builder may re-determine housing possibilities.

Municipality: Political, zoning and planning decisions unrelated to metropolitan needs and effective markets pre-determine many housing policies and building programs, such as two-acre zoning, or over-development of small "garden" apartments without gardens, i.e., build in high transiency, high, quick returns. Largest property interests tend to be most effective in meeting their short-term interests.

Metropolitan: Lack of real planning, policy or government mechanisms leaves large gaps in meeting housing needs throughout the urbanized and developing fringe areas; or such needs are met poorly in the wrong locations under negative circumstances, i.e., all low-income housing built in the socially and economically poorest locations, with worst facilities, least leadership and positive forces.

Financial: Commercial and government lending institutions allow or refuse financing only in certain areas without regard for needs of whole urban area; motivations for loan of capital may be short-term extractive, such as syndicates of "hot" money to invest in quick-return garden apartments, or slum manufacture carried on for return of capital in only a few years.

Frank printed guides comparing various programs

Continued consumer education on interest, factors of livability, cost.

Education of leaders of civic organizations, individuals, officials of municipalities as to the results of each type of housing program. Those who pick the professionals need to be reached.

Development of generalists in local government, financing institutions, housing agencies, non-profit, consumer organizations with knowledge of the full range of housing needs, choices, factors and facts.

Professionalization of "consultants", planners in housing and development, training, workshops, standards, publication of qualifications and experience.

Adult education in housing, consumer oriented for individuals seeking to buy, build or improve a home.

College curricula in total community planning, development and housing.

Raising to high visibility in citizen policy organizations, local, state and national government, all questions of housing policy and programs, quantity, quality, price, location, mixtures, bringing together an organization of service groups (cooperative, non-profit, consumer-oriented) to make possible more strength, time, personnel, budget to be given to questions of policy, program and research.

Formation of metropolitan government organizations to raise effectively all matters of housing policy and carrying out of programs, including especially total need, location, price, program selection, construction, and positive management with less regard to smallest local boundaries.

Financing policies, both commercial and government should be publicly reviewed and debated. All organizations affecting the flow of capital into housing should receive through examination by competent public and non-profit bodies concerned with the total welfare.

Survey of factors in choice of polices by range of initiators. Market, size of families, income level, location, occupancy policies; public housing, limited income, private owners of multiple housing.

C-Performance

The principal measure of the effectiveness of policy determination, against the total local need and its spectrum of special needs, is the effectiveness with which a variety of needs are met by the local decision making process. Where there is clear need for hundreds or thousands of low and moderate rent dwellings, to what extent has the local power structure recognized this need and made appropriate decisions regarding new construction vs. rehabilitation, demolition, relocation, and adequate tempo and relating of the various parts of a total view of improvement programs? Local programs often leave much room for improvement and favor only small parts of the community, i.e., are not responsive to the movements and needs of the total community and in particular those with the most serious housing need.

D-ASSEMBLY OF TEAM ELEMENTS

May include lawyer, realtor, architect, financial advisor, planner, market analyst in varying sequence.

Different initiators go to different professionals
- Individual may go to bank first or to builder
- Builder may go to realtor for land
- Service groups go to lawyers most often, sometimes consultants or architects
- Government agency may go to a political body and planning commission, with a lack of overall policy during the search for sites.

Lack of knowledge of the individual, group or builder of all plan elements needed and how to get them to work together.

Domination by first element or elements on the scene.

Individual may be influenced by chance arrival of first relative, friend, lawyer or person in the building.

Non-profit service group may be dominated by a lawyer or architect or an individual director to the detriment of a full view of choices or development of the total team and best input of each element.

Examples:

One non-profit corporation, church-sponsored, held up for a year because the lawyer could not get enough of a kick-back from a builder for a proposed 221(d)3 moderate income development.

Realtor told another group not to buy in an area because of racial mixture.

Builder-backer of housing for the elderly held one group to a piece of land he already owned and for which he wanted a price double his cost.

Government official left his position to become a consultant and seek as clients those groups with whom he had formerly dealt.

Examples (continued)

Lawyer for clients owning a piece of land guided a non-profit group to the same piece of land and coordinated all actions of the group.

Lack of knowledge by government agencies, especially small local ones, of the quality needed in each team element and how to get the best use of the team as a whole. Professionals sometimes picked by price in a kind of auction.

Lack of insight of professionals as to proper roles of other team members, constant drive to expand ego and monetary return by expanding individual role, regardless of competence.

Lack knowledge or group dynamics within service housing groups to achieve participation without interminable delay, decision without tyranny, understanding with action, feed-back with maximum response, minimum wear and tear.

Architect offers and payments of 5% or 10% finder's fee to other professionals who bring them work.

D-Corrections

Clear definition of the role of each needed, listing all valuable team elements and functions in the production of housing.

Description of desirable methods and interactions for total team operation.

The above can be done for the different kinds of initiators.

Training of executives, public non-profit, commercial in constructive group operation, participation, communication, decision making, feed-back and responsive evaluation.

Written contracts covering any and all fees; full disclosure and certification of costs and fees.

D-Research

Relate professionals chosen by large commercial government, or service housing corporations to universe in metro area of architects, lawyers, planners, financial and administrative advisors, sources of new and experienced professionals. Needs expressed for professionals by sample of initiators. Do flow chart of decision making process. Estimate reasons for delay or inaction of builders, local government agencies in housing, service organizations. Examine structure and method of payment of professional fees, delays, cost of collection. Survey national professional organizations as to existing techniques, information, new actions to develop personnel.

D-Performance

The first question under a performance heading is an estimate of the supply of competent professionals who aid in the housing process, including finance, legal, financial and administrative consultants, architects and engineers and others. The second question is the effectiveness of communication between these professionals in or near the local scene and those responsible officials of public or private organizations who are assembling the professional team. Some measure of whether or not the most competent were selected or at least those of average competency. This raises the question as to the knowledge of how to select the professionals which may be of more critical importance than often given this early step. Beyond the matter of selection there is the question of working out contracts and then working with the professionals, making the best use of them with there being neither badly subordinated or taking more than desirable responsibility. There is a wealth of good and bad examples of these relationships which can be measured or at least evaluated in frank local interviews.

E-PRELIMINARY ESTIMATE OF TOTAL COSTS

Often inadequate knowledge of factors and changes

Areas for savings not known

Professionals don't have total view of the process

Need to calculate value of time
Interest, labor, input - travel - political contributions, uncertainties, preliminary expenses as well as land, construction and professional fees

1. Lack or knowledge of all cost elements.

2. Under-estimation of time factors and resulting costs.

3. Failure to list and relate all factors to initial costs, time, sustaining and hidden costs.

4. Instability of many cost factors, interest, "points", materials, land, labor supply, supervision, outside of initiator's control.

5. Surprise costs in site, allocation or rationing of materials, change in quality of labor supply (even though wage rates are stable or have predictable increases)

6. Caprice of political and governmental mechanisms in time especially, licenses, permits, zoning, personal pay-offs, political contributions.

7. Unpredictability of market and marketing time through changed employment, mass attitudes, expectation of income, taxes, inflation, war.

8. Bad habits of general contractors in withholding payments to sub-contractors, materials, suppliers, professionals.

9. Ineffective standards writing, performance record and means of inspection.

10. High cost of "drag-out" time by contractors, failure to complete last 1 to 5% of construction work.

E-Corrections

1. Training materials, lists of all cost elements, description, choices, dangers and instabilities, aimed at specific markets, i.e., single homes, apartments, rehabilitation, new towns.

2. Research on component parts and tracks, actual time spent, estimate of time-produced costs, interests, overhead.

3. Check list for all cost factors and ranges of experience with costs.

4. Setting of interest rates for one-year periods, as with wages and taxes, publication of series on labor supply and allocation, flow of permits, land use, materials production and distribution, contracts.

5. Special analysis of experience with surprise costs, such as hitting unexpected rock, changes in labor productivity, flow of materials, legal problems (sub-contractors, held back payments)

6. Recording of time and costs of local government actions in connection with building; advance scheduling, time predictions and limits on all decisions.

7. Research on marketing, statistical series evaluation of mass factors affecting marketing, prediction. Achieving of a more responsible and predictable economy.

8. Analysis and recording of payment methods of major building organizations. Writing of standards and clear contracts, cash reserves, credit and bonding, enforceable penalties for such clearly-tracked procedures as pay-outs for work performed.

9. Analysis of factors in standards writing, substitutions, change orders, actual performance and workmanship, and inspection. Analysis of poor operations should be instructive.

E-Research

Who makes this in group building? How accurate were they? Flow chart. What changes through no internal fault or oversight? Interview sample of types of initiators.

E-Performance

A sample of this factor in housing development by private builders, local government agencies and service organizations can be easily made. The goal here is accurate cost estimation and the measure is the intial estimates prepared by architects and related professionals. The inflationary trends of the past few years can be included and properly related in such estimation, so that the question can be measured as to whether or not the leadership in each housing program and the professionals had reasonable ability to estimate costs or were even further off than the inflation might have suggested.

A further question under this heading is the instability of costs which will be pointed to by this particular line of investigation. The degree of error may indicate more the nature of the building industry within the total economy than it will lack of knowledge, motivation or competence on the part of those doing the cost estimation. This latter line of discovery is also of marked value to future actions to improve the quantity and price of housing.

F-ESTIMATE AND SECURING OF START UP FUNDS REQUIRED

Architect, legal, planning and other consultants, land, preliminary costs such as test borings, topographical surveys, market analyses.

Individual - down payment, or land, architect - sources, cash, credit, friends, relatives

Service Group - One professional usually, has some view of time, salaries, fees, other professional costs - lawyer, minister, teacher, sources, loans, endowments, combined personal credit, contributions.

Government - either doesn't measure total or analyze cost and time of steps - or indifferent, knows total but doesn't measure past steps or project future ones.

Established Builder - best informed, has his records, has credit or uses previous accumulated capital; utility, title companies and material suppliers will sometimes advance funds to known and trusted developers.

F-Inhibitions

1. Individual has little view of the total cash flow, including start-up funds.

2. Service group may have little money, or very little accessible for start-up funds and hence try to accomplish housing as a venture at everyone else's expense.

3. Lack of knowledge of all start-up costs including exploration.

4. Lack of knowledge of credit and presentability to get credit to handle 1 to 3 above.

5. Extreme delays in local and federal government housing agencies or unpredictability as to tempo and factors affecting movement.

6. Lack of knowledge of just how much time is spent by professionals prior to commitment of financing and then start of construction (and usually payment).

1. A flow chart and check-list for start-up funds and all cash flow should be prepared.

2. Seed money, matching in part, on credit to responsible non-profit service groups should be available from commercial (risk), government and service sources before the entire development is designed, committed and guaranteed.

3. Check list of all start-up costs and fair practices for individuals, service groups, local government agencies, commercial builders.

4. Record successful experiences as for example, a) ten men who signed notes at a bank for $1,000.00 each to start a middle income housing corporation, New York City, b) nine ministers who signed personal notes to secure a loan from a reluctant bank of $38,500.00 to purchase land for elderly housing before any government loan was available, Elliott House, Atlantic City, N.J., c) a gift of $3,000.00 and an unsecured line of credit of $25,000.00 obtained from a local bank, Queen Village, Philadelphia, d) a group of fifteen persons who issued notes to raise the first $25,000.00 to purchase properties for rehabilitation, later raised $200,000.00, hunted for and obtained mortgages in a mortgageless area, Powelton, Philadelphia.

5. Analysis step by step of time factor in initiation of local federally assisted housing and the probable cost of that time, including relations with the regional HUD office (H.A.A.).

6. Time recording analysis of cost of professionals engaged in housing development prior to their contract, prior to financing commitment and prior to start of construction. This should include all factors of overhead, illness, vacation, delay in payment, risk interest, salaries, office, other expenses.

START-UP FUNDS

F-Research

Interview sample of medium and large builders as to capitalization, service groups. Outline seed money procedure by local housing authorities and by special city housing funds. Survey states and 200 major cities on existence of any trigger organization for condemnation, acquisition, technical advice, seed money to service organizations. Builder use of credit and capital. Survey national and metropolitan organizations providing technical information regarding start-up funds, costs, professionals, procedures. Survey state aids for start-up information and funds.

F-Performance

Performance in this area of investigation includes the amount of start-up funds which were available for the various types of multiple developments as well as single family initiators, and the sources from which these were obtained. The cost of obtaining the start-up funds, the length of time necessary to raise them, the relation to total capital needed, and to policies of local financial and other institutions are all part of the picture of performance measurement of the flow of housing.

G-SITE INVESTIGATION AND SELECTION

1. Comparison of alternate sites
2. Selection, agreement of sale and usually at least partial payment, such as 10% of total price
3. Title Search by local private title company
4. Negotiations with owner of land
5. Real estate transaction
6. Closing costs
7. Secrecy of purpose
8. Approval by organization if required

1. Lack of knowledge of a variety of sites.
2. Lack of general knowledge of availability of some sites, or special conditions of availability.
3. Push or control by owner of one site.
4. Difference between asking and final price.
5. Lack of knowledge of all factors affecting the site.
6. Costs of "Title Search".
7. Costs of real estate transactions and closing costs.
8. Unwritten restrictions on use of land such as local political opposition to apartments large enough for children (school taxes).
9. Zoning for population and income choice, such as 5 or 2 acre minimum lot size.
10. Restrictions on land use, requirements for streets and utilities to keep out low and moderate income families (and largely exclude non-whites by economic requirements).

G-Inhibitions-2

11. Necessity of secrecy while purchasing one site (but looking at several) or enlarging an already owned site by additional purchases, or making a large assembly of sites, due to rapid price inflation if revealed.

12. Diversion of increased capital into land speculation in time of rapid inflation. Philadelphia suburban land prices are estimated by realtors, to have risen 30% in two years, 1966 and 1967.

13. Land held for future use or resale at too high a price for present use.

14. Higher utility, paving and servicing costs required on vacant land at public expense for anticipated private profits.

15. Open land badly maintained, trash, holes, water, danger, cliffs, scars, cut timber, abnormal growth (Poison ivy, etc.), junk cars making the area less attractive for development.

16. Effect of large governmental uses, utilities (such as high-voltage transmission systems), institutions (tax exempt) on policies, uses and costs above.

17. Inadequate, lagging, poor or non-existent planning for public uitlities and paving is a detrimental factor to rational, timely and economic use of land.

G-Corrections-1

1. Adequate descriptive materials should be prepared on site factors, descriptions, choices.

2. Studies by local planning commissions and listing of all vacant land showing owner, zoning, size, adjacent parcels, tax assessment, last price paid. Special factors, should be listed including substandard or under-used groupings of land, non-conforming uses, whether the land appears for sale or not. This should be machine run, kept up to date quarterly, publicly available. Research could be done on the cost of such a current, public inventory.

3. Public record of parties at interest and disclosure in all recorded transactions.

4. Analysis of relation between "asking" and actual sale prices in acquisition of groups of parcels by local public agencies, service housing corporations, rehabilitation, with changes over an extended period. Research-comparative land prices paid for various types of land by location, character of area, zoning. Training-consumer oriented education on nature of land in the economy as it is, the role of different elements in achieving value, assessment, price earnings.

5. Check lists of all factors to be considered for sites for varied housing programs.

6. Analysis of actual Title Search problems. Perhaps this and so-called Title "insurance" should be a public function.

7. Analysis of, "Closing cost" practices, insurance transactions, recording, tax advances, escrow funds benefits, operations and effects of title companies in land transactions.

8. Analysis of unwritten but real restrictions on land use and sale, as against children, or resulting from local service costs and tax revenues, low income families, non-whites, institutions. Action-Metropolitan analysis of needs, thinking, policy and programming to meet area-wide needs.

9. Metropolitan review of zoning practices and policies.

10. Analysis of costs of land development and social results, paving, street design, open space, community facilities, utilities.

11. Analysis of the practical effects on meeting housing needs of low and moderate income families, of design and other use requirements and restrictions.

12. Increase capital gains tax to approximate rates of income taxes; i.e., discourage use of land for speculation. Capital gains taxes if somewhat lower should have the holding term increased and be recognized by federal taxation for use of land and buildings over a period such as ten years. Mark-up of land price is often the major profit of a builder, promoter or speculator.

G-Corrections-3

13. Real estate taxes on vacant land should be steadily raised toward the use value of the land, rather than held low for non-use and thus become a factor in decreasing availability of land for development. The present tax system as it applies to vacant land is to a large extent a publicly borne cost for a substantial private benefit.

14. Increased taxation of land with developed access and utilities should fully meet public costs, including all servicing and interest on improvements.

15. Firm enforcement of proper conditions should be backed up by budget, staff, performance of correction and lien and taxing power against the nuisance owner.

16. Analysis of costs and benefits of large special uses of land with proposed corrections, such as condemnation of use right by utility companies without (in Pennsylvania) requirement for review by planning commissions. Economic costs and effects on land owners and communities should be analyzed and means of reimbursement authorized including taxation and annual payments.

17. Public (local or metropolitan with state or federal aid) planning, construction and capitalization of utility systems and services should be matched by assessment upon land served and charges to meet and pay off capital and servicing costs.

G-Research-1

Interview of sample of builders in several metropolitan areas as to their procedure for obtaining sites. Interview with a sample of local public agencies and service housing organizations on site selection. Relate these interviews in selected metropolitan areas with the sale of medium or large parcels of land, serviced and unserviced, in the metropolitan area over the preceding five years. Plot trends of prices and amount of turnover of parcels. Take a smaller sample of transactions to obtain exact information on all direct land costs and related costs such as title, search, fees, closing costs, and length of time held before development. Analyze from a sample of completed developments on the length of time before start of construction, when investigation of sites began, how long the site in particular was held, cost of site, financing of site purchase costs, including interest.

In a small number of selected metropolitan areas, obtain trends of flow of capital into land purchase over past decade and apparent

G-Research-2

change in prices. In the same metropolitan areas, examine procedures for installing utilities and paving, methods of charging and actual trends of costs and compare.

In a sample of cities, investigate procedures for eliminating nuisances on vacant land and means of enforcement.

As part of metropolitan aspect, examine means of forward planning for public utilities and paving, related to amount of land available for development, year by year. Is the tempo and method of planning adequate to the need of the past decade and the next decade?

G-Performance

Study of a small sample of developments completed in regard to this phase would reveal both difficulties and successes regarding sites for the housing. Against a goal as to quantity and type of land during a given period such as one or two years, it would be possible through interview to esample the extent to which initiators studied a variety of sites, the factors which led them to final selection and the length of time for such selection. The important factors would include an adequate advance preparation of streets and utilities, resolution of legal questions, easements and rights of way, procedures of local governments and attitudes and actions by civic groups.

H-ZONING REVIEW

Existing zoning and requirements.

Possibility of change and past record of similar changes

Political and economic forces have continued pressure on municipal officals.

> Example: In Newtown, Pa. 3 of 5 supervisors own farms, stood to benefit from down zoning of R-1. land. Village II, New Hope, Pa. - political organization was against a well designed new development on grounds that it would upset political balance - although many business men approved the new development and the required zoning change.

Legal expense -

Time - interest, developer hours, alternates.

1. Rigidity of zoning against meeting present area-wide housing needs, and achieving a balance of population in a municipality, county, and metropolitan area.

2. Need for minor revisions to make proposed projects economically profitable or feasible.

3. Cost in time, interest, cash or other political pay-offs to obtain major or minor changes in zoning. Deliberate delays by local officials or at best, lack of will to set firm schedules and expedite decisions.

4. Excessive flexibility on "special" applications by "cooperative" elements, or generally, so as to destroy consistency in physical or procedural patterns.

5. Influence of existing powerful elements to prevent change by newcomers, or to select and favor certain kinds of change in chosen locations.

6. Lack of specialized knowledge, lawyers and others experienced in zoning procedures.

7. Excessive control or invluence by "zoning advisors" tied in with political controls and tolls. Lack of knowledge of "gatekeepers", where decisions are actually made.

H-Corrections

1. Develop standards and procedures for zoning review by local and metropolitan mechanisms, similar perhaps to inducements of the federal "workable program". However, local governments with greatest economic needs tend to be most interested and responsive to "workable programs" and federal aids. Most secure and exclusive areas tend to be least concerned and least participating; Metropolitan leadership and thinking would help.

2. Goals for quick scheduling of reviews and decisions on minor variances. (Like rulings within 10 days).

3. Analysis of time flow of zoning cases, with targets recommended for local bodies and procedures.

4. Functioning citizen organizations to watch flow of all zoning operations with means of identifying and measuring favoritism and politically based exceptions.

5. Identifying and public disclosure of ownership and interest in land for elected officials, appointees and staff of local government.

6. Training, workshops, materials, reports for citizen leadership, commercial and service executives in zoning goals and procedures.

7. Above to identify political spokesman for zoning affairs.

H-Research

Interview sample of medium and large home builders in selected metropolitan areas for their individual and joint recommendations on the problems of zoning. Report existence of metropolitan planning organizations and extent of their work on overall zoning comparisons. Attempt to estimate distribution of land under different kinds of residential zoning and compare with probable housing needs at various price levels. In selected core and suburban municipal governments, review a record of zoning variances and changes over past five year period. Relate racial and proportion of changes to existence of citizen organizations and citizen interest in zoning. Try to measure extent of observation, participation and support or resistence to zoning changes by other than directly interested parties.

H-Performance

The key measurement here is that of an adequate flow of land for the actual total market in the metropolitan area as well as each municipality or county. The adequacy of planning and procedures by a metropolitan planning commission, followed by the summary of local plans and then actions by each local zoning board, would give a picture as to whether or not an adequate supply of residential land was possible and produced to meet the range of housing needs throughout the metropolitan area. The extent of blockage of this procedure on the other hand, where an exaggerated and unbalanced approach to zoning could be ascertained, is a key measurement of performance of the zoning function in relation to housing throughout an urban area.

I-INTERMEDIATE PROGRAM DETERMINATION

Re-evaluation of all previous factors - Seed money, time, cost limitations, product and return

Decisions affecting all subsequent factors

Number of units

Cost of construction

Lapsed time

Main source of financing

I-Inhibitions

1. Incomplete assembly of facts and choices under previous steps; lack of synthesis of all previous steps.

2. Decisions made too narrowly, i.e., all team elements not involved effectively in review and decisions for next steps and the complete result.

3. Proceeding on final working drawings without digesting all previous in-put.

I-Corrections

1. Check list for recording all previous steps and indications therefrom

2. Effective review and group process at this point.

3. Recording of decisions made, with projected time goals.

I-Research

Select a sample of commercial and service building organizations and review programs over several recent years. Examine and report predominant influences and factors in making program determinations prior to start of design.

I-Performance

Actually program is being determined throughout the proceeding steps. This section was listed separately in order to indicate a drawing together of all previous threads regarding such matters as start-up funds, site selection, zoning, cost estimation, so as to show a level of readiness to proceed toward start of construction. This might be regarded as the top of the hill from the point of view of getting a new program under construction.

A key measure toward use of performance standards at this point would be the length of time required to bring all previous factors to a satisfactory or at least possible working relationship. Definition as to where this top of the hill point occurred and the difficulties and steps leading up to it, would measure the performance of the housing programming up to this policy wrap up point.

Even though all of the previous stages are overlapping and interacting, this represents the point of effective final decision making in the planning, and integrative process after successfully negotiating each of the previous factors.

J-PRELIMINARY DESIGN

Start of architectural work

Targets for design, units, rooms, spaces, functions

Cost estimate of each element

Related facilities, in and near housing

Treatment of land -

Size of family, age, income level

Assumptions about people to use housing (and related services, and special needs and characteristics

Effects of Codes and Zoning Requirements

Preliminary standards for construction

1. Lack of clear statement of goals for life in the program chosen, its relation to community and area.

2. Inadequate role and training of architects in this culture for relating physical design to social decisions and targets.

3. Lack of proper flow of payment to the architect and the resulting pressure for economic constriction against exploration, experimentation, attention to detail, careful weighing of alternates.

4. Lack of market analysis to aid owner or sponsor to give clear direction to choices and limits, such as age and size of families, income and hence capital cost limits.

5. Rigid specification codes often lead to less appropriate or costlier materials, designs and construction methods and retard introduction and development of new components and procedures.

J-Corrections

1. Clear written statement of goals for life in proposed housing, relation to community and area (community and area may or may not coincide as for instance: elderly housing for a Greek Orthodox Church serving a metropolitan area, or a neighborhood, non-sectarian, non-profit group to serve as a sponsor and serve primarily the neighborhood.

2. Architect responsibility for choice of contractor, sub-contractor, performance bond, cost estimates, penalties and supervision of methods of construction as well as results of construction.

3. Regular, dependable and fair progress payments to architects for stated work.

4. Timely obtaining of market analyses, series and their projections or at least careful guesses in regard to age, income, size and characteristics of occupant families.

5. Tie management aims, style and procedures in at an early date so that sponsor or owner can give the architect a clear description of management and operations.

6. Codes should use performance standards as much as possible, or specify "equal to" existing materials where feasible alternates have not yet been found unseable. Means for regular re-evaluation and interpretation of codes should be built into code procedure.

J-Research

Interview sample of architects developing multiple groups of single houses, garden apartments, high-rise apartments for their report on factors effecting preliminary design. Interview officers, owners, local government housing agencies and service housing organizations as to their view on weight of factors influencing preliminary design. Report extent of market analysis, recommendations by commercial or government financing agencies.

Interview sample of architects of large scale housing as to which building codes in their opinion have been or are most restrictive at this time and most in need of revision.

J-Performance

While this is one of the most difficult areas to quantify in order to make use of a performance standard, nevertheless it is an important and possible one. Detailed study of the use of performance standards should help at this point to make a clear statement of goals, from the client to the architect, from the builder to the draftsmen and the sub-contractors. A list of all relevant factors should be prepared at this point for the key design decisions, including not only materials and spaces, but also the relationships with neighborhoods, vistas, surrounding traffic and other factors in the environment. While the goal might be defined as a piece of cheap junk without character to be built as fast and as cheaply as possible, regardless of later social and maintenance cost, nevertheless, esthetics are still a question of major importance and to a considerable extent measureable. Has the new development achieved a human scale and the possibility of relating? Does it have interest, delight, surprise, warmth toward people as well as optimum structure at the economic level chosen?

The preliminary design can be evaluated, not only against the decision of the initiator, which is valid and important, but also against the total statement of housing goals for the community and for the market and location to be served.

K-PERMANENT FINANCING

1. Review of market experience of housing for area targets selected

2. All negative aspects brought out by lending institutions regarding area, site, design, proposed people, facilities and services

3. Site approval by capital source or control

4. Conventional capital - banks and insurance companies term, rate of interest, stated equity, (inflated, fictitious) real equity (100% mortgaging objective, except land)

5. Public agency capital control by direct loan or guarantee
   Federal Housing Administration
   Farmers Home Administration
   Housing Assistance Administration
   State Governments
   City Revolving Funds
   (Phila. Housing Devel. Corp.)

6. Secondary mortgage - FNMA
   general operations
   special assistance

7. Use of "approved mortgage" from FHA list

8. Requirement of "points" at this time -
   service fee device - 1% extra over legal interest limits charged by banks and other lending institutions.

9. Pension funds and Social Security funds
   large capital accumulation
   public policy involved in investment

10. Trust funds and foundations

11. Amount of equity needed, real or stated, interest, alternate investment and use of time by builders

1. Instability of housing market leads capital sources to examine carefully all variables and those most likely to change - income, employment, turnover, poor maintenance, obsolescence, management, record of builder, community character, racial change, (quality of local government, institutions, resources).

2. Irregular flow of capital into institutions lending for housing, diversion of American capital for higher returns in war, cheaper production nations (such as Japan), inflation, with drainage from housing sector of U. S. economy.

3. Too many control points, delays, lack of policy, inadequate supervision or analysis of work flow in local and regional government housing finance agencies.

4. Policies of conventional housing, capital sources for highest and fastest returns, usually without consideration of social, national or metropolitan policy.

5. Increasing "point" deduction for loan of capital because of capital diversion, and higher equity payments and ultimate cost to the consumer.

6. Rapid rise in interest rates to sharply increased actual annual cost.

7. Lengthening of the term of mortgage without interest reduction, greatly increasing total interest cost to consumer (life cost of house).

8. Immediate response by increase in cost (and hence capitalization by builder, land holder, and lending institution) to every government effort to lower monthly cost to the consumer by lowering interest, lowering down payment or lengthening the term of mortgage amortization.

9. Price-rigging and informal control or agreement costs of materials by small numbers of major producers as in plumbing supply (oligopoly) and restraint of effective competition.

10. Small character, small financial resources of most builders, related to 1, 2, and 3 above, or conversely few large, competent, well-financed building organizations, capable of long-term planning of land acquisition, cadre development, financing, construction and marketing.

K-Inhibitions-2

11. Lack of vertically integrated building operation controlling or at least assuring even flow of
    a) acquisition
    b) start-up money
    c) key personnel
    d) materials
    e) labor, especially annual wage
    f) marketing
    g) statistics and research
    h) design and experimentation

12. Lack of knowledge by mortgagees of complete range of financing possibilities. This is a function in part of size (small savings and loan associations) narrow gauge systems (savings bank handling only FHA insured mortgages or commercial bank subsidiary handling only conventional loans).

13. Narrow policies and narrow control of large capital forming groups such as pension and trust funds, church endowments, through habit, lack of knowledge or motivation for social housing or any housing; yet such groups will invest in common stocks, speculative conventional mortgages or low yield, government securities. Trusts claim to be conservative, but through inside control will direct funds to special interests other than service housing, even where the purpose of the foundation of trust is ostensibly social.

14. Weak, minimum, traditional management of housing, especially for low and moderate income groups is an inhibiting factor to investment in such housing. Traditional short term extractive management or long term high-priced luxury management is poorly equipped to lead or participate in establishing strong communities among limited-income families and neighborhoods.

15. Limited number of lending institutions, small size of many (higher risks, limit on amount of loans), trade engendered restrictions on formation of new savings and loan associations.

K-Corrections-1

1. Adequate employment projections for metro areas, 6-year capital budgets by cities, 10-year highway plans, quality and clarity of local government procedures, tax rates fixed for four years.

2. Removing legal top limits on interest and investor payment rates might make all capital forming organizations more competitive in the short run. However, it is felt that raising the interest rate will not significantly increase the overall flow of funds into housing, as compared with 9,000,000 automobiles in a year, war diversion, institutional construction into less rigid cost ceilings, the highway complex drive for public funds, and flow of capital into low-cost nations. This is not an editorial but an observation of the scene.

3. Clear systems analysis, control and time targets are needed in government housing agencies.

4. Policies of lending institutions should be publicly examined. Allegedly higher risk areas should be the subject of policy proposals from within or without these institutions for allocations of capital to be proportionately shared as in some recent verbal offerings in Phila. not yet substantially implemented. This is necessary for public policy.

   The sandpit theory of the city is not, and will not work. Public or service organizations are needed to make such shared financial allocations work. Public pronouncements by bank presidents often get diluted by descent into middle echelon personnel of lending operations.

5. Elimination of interest ceilings at this time will reportedly get rid of points. The double standard of points with "legal" interest rates tends to be confusing, deceptive or demoralizing to the consumer of housing capital.

6. Interest rates are the keystone in the arch of costs and the largest cost to the consumer. They tend to become locked in this most rigid factor of capital in housing is felt to be the most important area of economic and policy study which can be made, but beyond the scope of this outline.

7. Lengthening the mortgage is only a temporary and inflationary device in an economy with continuing price inflation. Its advantages are temporary, perhaps aid the inflation, and are only a political expedient which appears to be useful for a short time. Increasing the steady flow of capital and lowering its cost (interest rate) are primary.

8. Government housing agencies should keep constant, competent analyses of actual costs of each component in housing. Efforts to lower land and financing costs are described in other sections.

9. Research on price trends of materials is helpful to understanding areas of price stickiness or parallel increase if not provable price-fixing.

10. Analysis of trends in size and capability of development and building organizations can put light on the question of size and capital backing. Credit and capital for builders to increase competence and capacity may be indicated, if benefits will accrue to the consumer.

11. Analysis of factors which would lead to more effective integration and administration of developers would aid this aspect of housing cost and production. However, savings are not likely to accrue to the consumer, if at all, in view of the condition of the industry and the probability of sale of everything which can get built in the coming decade.

12. Increased professionalization, training, organization of individuals in the mortgage business, together with useful printed materials of the present range of possibilities.

13. Public spotlight and policy discussion with guiding personnel in foundations, trust and pension funds. Special economic research would be useful here on actual performance of such bodies at a national and metropolitan level in the hitherto heavily neglected field of urban improvement.

14. Greatly increased training programs at college, professional and in-service levels for community management personnel, combining competent, properly motivated work with people, property, money and time.

15. Study restrictions against formation of new savings and loan associations, banks, trusts and other capital forming groups, particularly those which would be consumer oriented. Form mutually owned "Home Savings Unions", neighborhood or occupationally to encourage savings, proper use and availability of credit, in the hands of competent directors and staff for service to members' housing needs of all types.

K-Research

National economic study of flow of capital into housing lending institutions. What are the total resources of these institutions, how many are there in each metropolitan area or state of each major type. What proportion of assets were devoted to housing of which type in a recent year such as 1960 or 1967. What changes in policy have been made from 1960-1967? What changes in policy have been made from 1960-1967 in each type of major lending institutions?

What recommendations have a small sample of each type of lending institution got for the permanent financing part of the flow of housing. This is apart from the question of interest or charges but consists rather of recommendations to the various kinds of initiators of housing.

Summarize role of various government-financed housing programs in terms of number of units, number of people housed, volume of construction as related to total flow of residential construction and capital.

Special economic study of pension funds and social security funds. What factors would make it more attractive for flow of this capital into housing? Special study area of a sample of trust funds and foundations. What would attract these non-profit service organizations to place more of their capital in housing, especially for low and moderate income families?

Interview of selected sample of medium and large builders as to real and stated amounts of equity needed for various kinds of housing.

Make graphs showing variations in flow of capital into the housing market over the past eight years at least of possibly decade. Relate the flow of capital into all housing, with all new investment in the economy and with each type of housing.

Prepare tables showing total amounts of interest repaid over loans of varying term and varying rates of interest.

Special price study of certain materials used in housing such as plumbing and electrical supplies at a national level. Is there restraint of competition?

Study largest building operations in the United States and the extent of their vertical and horizontal integration, that is, size of operation, geographical territory, interlocking controls with related financing, materials, transportation and marketing organizations. (use Dun and Bradstreet)

In reference to large capital forming groups, such as insurance companies, pension and trust funds, church endowments, union funds, explore obstacles felt by them to larger investment in housing in the minds of decision makers.

K-Performance

The permanent or take out financing must be pinned down or at least in sight before construction financing is possible, even though the construction financing is used first. The effectiveness of performance in obtaining desirable permanent financing can be measured against the total market need in the area and for the particular groups to be served, the state of national mortgage financing and in the particular reason. Are the cost of money too high in relation to the market to be served and how do the downpayments relate to the chosen goals? Are banks in the area unwilling to regard housing as a prime customer? If the financing of individual houses or small new developments appears clearly inadequate to meeting local needs, have lending institutions had the idea and action to share risks in order to increase the housing supply, improve the housing supply or to reverse the decline in some neighborhoods? Has the quantity of capital made available through local lending institutions been adequate to insure a supply of housing available to all those in most crucial need? If not, to what extent does it fall short of an adequate performance?

Have other kinds of capital accumulating organizations responded to the need for housing? This includes pension funds, churches, fraternal organizations and even investments by labor unions. How has the quantity of savings and other capital been related to the quantity needed in local housing, the price and other conditions required?

L-FINAL PROGRAM DETERMINATION

Determined by K, Financing, all past experience on areas, people to be housed, by income, age, size of families

Record of developer or builder

Board of non-profit group

Financial goals

Role of Government Divisions
- FHA land planner
- Architectural division
- Manuals — CFA
- Can be different - FHA, HAA
- Tempo
- Motivation
- Need for generalists to look at and wrap up the final program

L-Inhibitions

1. Most profoundly influenced by K, Permanent Financing, taking place in the absence of national or local policy for housing, resources and allocations for mixed programs.

2. Inhibitors are basically the same as listed under I, Intermediate Program Determination.

3. Proliferation of government specialists, lack of generalists with view of total policy and programing.

4. Non-profit Service Housing Organization may still be confused, disjointed or not functioning together well to reach conclusion about program determination.

L-Corrections-1

1. Need for a national policy on allocation of resources to housing, means, types of housing.

2. Corrections much the same as listed under I.

3. Intermediate Program Determination with the addition of both specialists and generalists in local government agencies who can look over goal statements,

L-Corrections-2

3. ----applications, all design and costing data to date, view internal consistency of whole package, and then its relation to other programs.

4. Good staff work, training and group development of Directors and officers of non-profit service housing organizations. Special materials and competent, repeated workshops are needed. Research should do record keeping on development of these groups as special catalysts, especially for innovation of new approaches.

L-Research

Interview small sample of group initiators, commercial, government and service, as to major factors in final program determinations; role of architect, source of financing, government agency involved.

Investigate sample of government agencies including local FHA offices, regional HUD offices, local housing authorities, special city organizations and advisors on housing programming, information available to architects and home builders as to range of financing and selection of programs and major factors within them.

L-Performance

Against the evaluation of total community need for various levels of housing, how have the programs finally approved served the whole community? Have they filled the entire spectrum of housing need? If not at various price levels, has the quantity added been sufficient to allow a trickle down of standard housing meeting local housing codes? In short has the building and lending industry met the local needs and if not to what extent has there been a continuing deficit?

M-CONSTRUCTION FINANCING

Direct loans - H.A.A., C.F.A., for construction

F.H.A. - Approved mortgagee list, insured loan during construction

Highly unstable market fluctuation on points charged;

Policy changes - areas and types of housing.

Varied choices by builder, some flexibility among private lending institutions

Builder commitments for single family homes by FHA (85% of valuation) are a better permanent take-out than conditional commitments only for sale of one house to one customer.

Present fluctuation of interest rate. Construction financing may not be the same when needed as when planned and marketing analyzed.

1. Highest fluctuation in availability, cost, points, conditions. Completely dependent on current conditions. Completely dependent on permanent "Take-out" mortgages.

2. For FHA insured loans limited to "approved" mortgagees, a list kept by the local FHA office.

3. Policy changes by lending institutions regarding areas, types of loans, conditions. Some policies are unwritten, namely refusal to lend in certain older areas.

4. Lack of knowledge by individual, non-profit or new and small builders of the extent of choices or competition for this financing.

5. Collusion among relatively small number of lending institutions to fix rates, conditions and service charges.

6. Dependence upon successful experience of builder who also operates in a highly unstable situation. There is only a small number of large or easily creditable builders, even when larger construction opportunities are possible.

M-Inhibitions-2

7. High element of risk from shoe-string, under-capitalized general contractors and major sub-contractors who survive by holding back or appropriating undue proportions of progress payments properly due. This leads to higher and protective bidding by sub-contractors more frequent law suits and legal costs, slower construction and bankruptcies. These in turn feed back into higher risk, more delay, hence more cost in construction financing.

8. Mortgage specialists some times steer client builders to "favored" lending institutions, with "finders fees" to the mortgage placer. This tends to lessen competition.

M-Corrections-1

1. Study of flow of capital into construction loans, factors, costs and areas for reducing risk, time and costs.

2. Examine qualifications of a sample of "approved" and not-FHA-listed mortgagees to measure differences, any inhibitions to doing business, extent of innovation, service, size, other factors.

3. Policies of lending institutions should be stated in writing, in advance with changes announced long in advance, so that builders may project needs and costs.

4. Trade directories of lending institutions, outlines of contractual relationships, bases for fees.

5. Publication of fee schedules in quarterly statistical series.

6. Customers and lenders can require builders to submit complete records of building experience together with financial statements and credit ratings from a central or regional rating bank of individuals and corporations in construction.

7. Effective control systems are needed for payout of general and sub-contractors according to work performed.

Rating of bonding companies on their performance.

M-Corrections-2

8. Standard contracts for mortgage specialist services, in both construction loans and permanent mortgages, with full disclosure of all fees, payments for service.

M-Research

On a small sample of metropolitan areas, examine sources of construction financing during a given month. Investigate all possible sources in that metro area for several types of construction (other than direct loans from the government).

Over the past eight or ten years, chart graphically the fluctuation in cost of construction financing for most frequent types such as a group of one hundred or more single homes FHA insured or conventional to most favored builders and to smaller, less favored builders. Examine extent of simultaneous change of cost for construction financing among major lending institutions. Interview sample of representatives of major lending institutions of this temporary financing. Attempt to examine the facts in a recent year regarding finders' fees, and other special costs for construction financing, including points. Estimate total volume of construction financing by type of lending institution and the amount of construction financing advances by the largest lending institutions.

M-Performance

Against the estimate of total quantitative need, how has the flow and availability of construction financing been? What has been the term available and the interest rate? Is the supply adequate for replacement of dilapidated housing and enough to keep pace with the growth of the community? What has been the time necessary to obtain the construction financing? What has been the role of FHA insurance in social programs such as 221(d)3, the length of time necessary for processing and the cost of such time? How has the interest on loans for construction compared with other kinds of loans, non-residential construction, business, personal or otherwise? How much competition is there is the metropolitan area with a variety of rates for such construction financing? How has the lending system as a whole functioned in this area so critical to the launching of housing programs?

N-WORKING DRAWINGS

Number and distribution of units

Sizes, spaces

Appearance of development

Livability

Management and Maintenance, plan for operation

Community and commercial facilities

Design for use of ground

Conflict between low capital costs and low maintenance costs; too much emphasis on initial price leads to built in obsolescence

Architectural assumptions about people

Sponsor assumptions about occupants

Selection of standards, materials, specifications, utilities.

N-Inhibitions

1. Lack of clear guidance from the market to the builder, service sponsor, or government agency and their guidance to the architect as to size of units, spaces, functions, appearance.

2. Lack of knowledge or interest by the owner or architect in the long-term operating costs of materials used.

3. Lack of knowledge or interest in social patterns and reactions to final product, materials, appearance, sound qualities, general lack of social observation, a clear value system and thinking as applied to physical design, such as the decision of many decades "No Showers in public housing", or no built-in fences for private yards, or management painting of all rooms a single color.

4. Lack of systems for evaluating occupant reactions and work and cost control of maintenance and replacement operations.

N-Corrections

1. Check list for basic decisions needed to evoke thinking by owner and inclusion in total planning process.

2. Detailed studies of operating costs broken down by such factors as these where apparent:

   (a) poor material
   (b) poor maintenance by owner or management
   (c) erosion from unexpectedly heavy use, over occupancy
   (d) replacement due to defect
   (e) due to accident
   (f) obsolescence
   (g) change in marketability, requiring later improvement.

3. Thorough observation of social behavior in home, apartment and neighborhood as these patterns might affect design. Feed-back system from use, opinion and costs.

4. Design a cost control system for maintenance of homes, grounds, community facilities.

N-Research

Examine the working drawings of a representative sample of most frequent types of medium and large housing projects, single houses and multiple, private and public, in several metropolitan areas. Examine plans and standards in regard to the conflict between low capital cost and later low maintenance cost. What factors lean toward the side of initial cheapness and what factors stood out in relation to long-term lowering of cost through use of better and usually more expensive materials? Interview architects as to the extent of review of standards as well as blue prints. What other factors made decisions other than architects and builders? Interview sample of builders on the same question, both contractors for government and service organizations and contractors or builders building for their own account.

N-Performance

One means of getting at the performance and its measurement in regard to the thoroughness and competence of working drawings, is an evaluation of each housing program after its complete occupancy. Comparing problems and costs in occupancy with resulting human satisfactions or dis-satisfactions, with the final work of the architect, can aid in measuring the thoroughness and competence in detail, the engineering, the foresight regarding the factors of management and maintenance. Have the working drawings and the specifications been appropriate to meet the original goals and estimated cost? Have the working drawings been properly carried out or to what extent did they suffer from omissions and errors in the first place? Did vagueness or incompleteness at this point lead to confusion on the part of builders or a lack of ability to control the builders by the inspectors and sponsors.

O-FINAL APPROVALS (LMN)

Each part has to agree with each other part,

Domination by financing

Legal clearances, papers, time, fees

Closing, start of construction, proceed order

Advance of funds -

Payment for land, fees

O-Inhibitions

1. After many parts of the work are done, cash, credit, site, design, permanent financing, considerable delay may take place on the final approvals and "closing" or advance of funds for land and start of construction. This may be lawyers making big things out of little with many papers, the financial institution, signatures of key persons, "Congressional Courtesy" on government-financed contracts (waiting for a time convenient to a Congressman for an announcement and news release). Delay on any one item may hold up conclusion and release of a dozen others.

O-Corrections

1. In this final stage, all papers should be brightly tagged FINAL meaning "Urgent - Do It Today". Excessive hold-ups have occurred in this phase. A single control of all papers, by lawyers, title company, financial institution or government agency with diligent preparation, scheduling and follow-up, is essential. Advance notices for preparation of documents should be sent by one responsible coordinating element. There is no need to take one to three months to get the pieces together when this can usually be done in one to two weeks at most.

O-Research

Interview sample of large construction operations already built as to length of time from substantial completion of financing and plans to the actual start of construction. What factors required the length of time reported?

O-Performance

The key question for evaluating the effectiveness of this part of the total process is hindsight as to the agreement of each part with the other. How much time was required for the final legal clearances and paper preparation? What were the standards for approval of each of the major elements, and how did these standards relate to the prior established goals for the particular program, for the total need of the community and for the original estimates of the particular goal? Where these approvals adequate to the job or did errors and omissions enter into the process for which a later price was paid?

P-CONSTRUCTION

1. Time schedule and coordination. Plan for administration of total effort.

2. Plan for general contract or central responsibility. Plan for payment of sub-contractors, flow of credit, delivery and protection of materials.

3. Organization of material components, production systems.

4. Change order procedure, role of architect in inspection, authorization of substitutions, Clerk of the Works, reporting on work progress.

5. Labor supply production goals in the face of craft division and empire-holding, limited apprentice supply, related to heriditary membership craft unions, (father-son), productivity restraints.

6. Procedure for owner (where separate from builder) participation, prompt approvals of changes, relation to supervision and inspection, payment authorization. Union leader putting his cousin in charge of relations with the architect and builder.

7. Minor controls on relationships, insurance, theft, vandalism, accounting, bonding of contractor, time penalties, right to terminate contract, right to occupy.

1. Loss of time is a major area of unnecessary cost. The sub-contracting system with many relatively independent parts, often results in dealy of one part holding up many others, disrupting the schedule, stretching out the whole process much more than the original item.

2. The sub-contract system is a major cause of higher than necessary costs, not altogether off-set by possible advantages of having competition by many small firms with high overhead and high bankruptcy rates. These latter may more often be caused by factors beyond control of the sub-contractors than inefficiency or malfeasance. The stock market or game of Blackjack would be a safer form of gambling than the present system.

3. Design and production of new and improved components in residential construction is one area receiving attention, especially to the need for research for better and cheaper elements, and to resistance by building codes and labor organizations. It has been stated that most elements in the industry are too small or poorly financed to do significant research. The largely handicraft types of materials are certainly high cost in delivery, handling and labor cost for putting in place. But this is probably the easiest area for innovation, and cost reduction if two other areas could be improved.

4. New systems of construction are a central need for technical and economic progress. Many European nations are using variations of the Nielsen system in larger scale operations. The small scale, or the overriding economic imperatives even when a larger scale is used in the United States, are a major obstacle to larger quantity, better quality, faster production, with new systems.

5. Labor productivity is high where compared with some other industrial nations both because of skills and machinery, but low in relation to potential to American technology. Many restrictions are well known including inadequate supply of apprentices, labor-restricted goals on production with power peculiar to the nature of the building industry here. Quotas on bricks, jurisdictional disputes between plumbers and steamfitters, obstruction by plasterers to drywall construction, bricklayers to use of curtain walls, are familiar stories. Restriction of craft workers to exact tools and items of work are a major obstacle to effective flow of materials, work and supervision.

   The rate of pay of building trades labor is often critized (except by daily and hourly wage earners) whereas the central problem is productivity of the total job.

6. The pressure for immediate and maximum profits often leaves the owner (if different from the builder) in a weak position. From this springs too little communication or participation, inadequate inspection, problems with change orders and substitutions and in the end, damn poor workmanship.

P-Inhibitions-3

7. The methods (fragmentation) of construction and the general morality of the economy lend themselves to a great variety of minor peculation as well as major thievery. Areas which need close watching on large construction jobs, whose totals can assume bulk though the details are small are (a) thefts of materials especially metals (b) vandalism (c) litter, trash, danger of fire from frequent carelessness (d) selection of weak of ineffective or inter-related bonding companies (e) selection of weak insurance companies because of kick-back of parts of fees (f) kick-backs among sub-contractors.

P-Corrections-1

1. The critical path method of construction has received increasing attention on large jobs. This and similar control systems should be increasingly utilized. Research would be valuable in estimating actual savings in all elements if total time were reduced to 10, 20, or 40 percent. American industry knows how to organize on a large scale as in 9,000,000 cars, 100,000 planes, 2,000,000 units of war housing, even in the middle of World War II. Time analysis of all elements of construction on small, medium and large jobs would be instructive.

2. Horizontal integration of elements of production might take place if general contractors were better capitalized for start-up, and there was a more even and dependable flow of construction and permanent financing. Some large contractors have taken over an increasing proportion of "general work" or to some extent own or have an interest in subsidiary companies. Research would be helpful on this interlocking, why it happens or doesn't happen what would help it happen, with what actual or possible savings to the industry and the consumer.

3. Research on building materials would no doubt be of continued value. Some large manufacturers of aluminum, plaster, etc., do research and bring out new products. Better components, modularization, national standards could bring about cost savings in both original and operating costs.

4. Economic underwriting on a vast scale and low cost capital flow appears to be the central requirement for use of new systems, with better administration, reduction of lapsed and lost time and with significant economy in construction.

5. Many labor restrictive practices can be seen to have originated in the high uncertainties of wide cyclical, seasonal and locational variations in employment. While positions are now deeply dug in, the imminence of rapid increase in work should increase the interest of organized labor as well as management in a guaranteed annual income, usual related benefits and greater security in employment. The existence of these should allow a break-through in increased productivity and industrialization of entire operations.

6. Clear definition, legal relations, specifications, time penalities and lines of responsibility are essential to protect the owners' interest and eventually the public.

   Since the owners cost of interest runs on by delays, he should be able to collect time penalties and without them out of 10% of value of construction withheld from contractors. Inspectors need to be held responsible to the owner and architect. The architect should be paid, expected and held to effective supervision in the owner's interest. This is often not the case in one or all aspects.

   Such high profits have in some instances resulted from manipulation of loan or insurance commitments, default on materials or workmanship, that great pressures and rewards come to those responsible for inspection--with obvious results. Loyalties, responsibilities, active work and reporting of clerks of the work and architects must be beyond question, closely watched and audited by an independent body.

7. Full disclosure of fees, "arrangements", rebates and direct costs is in the interest of all government-aided construction and commercially contracted also. The accountant, lawyer, inspectors, and architects should be held strictly accountable to the owner or developer. Independent spot-checks, observation, audits appear to be advisable as a means of inspecting the performance of inspectors and other control elements.

P-Research

In a sample of metropolitan areas, list major single and multiple housing developments. Obtain and breakdown time schedule from start of investigation for site, start of design, start of construction to completion of construction. Interview a principal involved in construction as to factors outstanding in relatively less than average time or more than average time for the project or community built. Categorize reasons reported for better or worse than average time.

Work closely with builder and, if necessary, pay for his time and time of his staff for detailed analysis of major construction factors. Analyze especially the savings which might have taken place if time lapsed were reduced ten, twenty, thirty or fifty percent.

Interview builders of large developments as to their views on possible savings from new systems and components which are most likely to be used over the coming decade. Obtain their reactions to section P - Inhibitions, or similar questions. Interview sample of owners (where different from builders) of large developments as to extent and lines of responsibility for inspection, reporting and payment. How would they do it over again and better if this appears to be the case. Analyze especially from the point of view of builders and owners the effect of an adequate supply of capital during construction. Analyze also all delays which took place, length of time for inspection, reporting and payment, and the interest or other costs related thereto. Obtain recommendations for improvement in the flow of labor supply, labor relations and work flow from the point of view of specialized skills and organized labor.

P-Performance-1

This is a vast area for analysis and evaluation of the effectiveness of performance. What can be included here is only an introduction and the raising of a number of questions. One of the largest is the amount of lapsed time, against the original estimate of time, and the areas where coordination of parts and supervision might actually reduce time sharply. Review of the foul ups by one sub-contractor against another, labor stoppages, material shortages and delivery problems and the many other areas that can go astray are part of this analysis.

One of the products of performance evaluation should be development of means of estimation of time. The critical path method is increasingly spoken of at least as a system for control of construction and signaling in advance as to the relationship of each part, need and sequence.

Another measure is the number and types of change orders. Were the orders approved because of previously unforeseen logic, change in materials, price changes or as a result of total surprise to the sponsor, architect, or builder?

Do the large number of instabilities in construction relate to a shortage of skilled labor, uncertainty in production and delivery of materials, unreliability of sub-contractors or their grasping at many jobs through the competive bidding system, sometimes with little regard to actual capacity for taking care of the jobs?

Conversely if all elements were produced at the right time and without interruption, and properly completed so that the next step in construction could follow immediately, what would be the total lapsed time? Out of such evaluations might each group develop more effective methods of control, contracting, economic back up, which would make a smooth flow of production worth the time of all elements involved? Penalties for late delivery of materials, for labor stoppage, for failure to complete a step of sub-contracting (and thereby holding up all subsequent steps) might be one legal and financial approach. However, there are so many parts and so many variables that a full discussion of use of performance standards during the actual construction pahse would be far beyond the scope for this paper.

It should be emphasized however, that the writer feels, from his experience and study, that the largest emphasis should be given to the basic dis-organization of the industry as a whole and in particular its acquisition, financing and marketing parts of the pipeline, which greatly out-weigh its problems in physical construction. The construction dis-organization, it is felt, could be greatly improved if the other parts of the pipeline were able to flow more rapidly, more smoothly and with great assurance of steady movement on the part of those carrying it out.

Q- PRE-OCCUPANCY MANAGEMENT

1. Goals, duties, and quality of management are assumed, consciously or unconsciously.

2. Operations budget is usually hypothesized.

3. Staff schedule and job-descriptions.

4. Selection of staff and style.

5. Orientation and training of staff.

6. Advertisements, printed materials, circulation to markets.

7. Interviews, telephone, correspondence, rentals (or sales).

8. Occupant preparation -

   Community and resources
   Physical maintenance
   Management relations

9. Move-in scheduling and physical preparation.

Q-Inhibitions-1

1. It is often necessary to occupy new construction before the work is completed. The owner is seldom ready, in understanding and theory, or organization. Owners are under pressure for financial solvency. Tenants are often moved in (or buyers) before policies are formulated, personnel hired or properly trained. This can result in initial hostility, frustration and aggravation which can be long lasting, with continued negative results in low morale, poor maintenance, trash, vandalism and movement out. Owners have often assumed that a highly active market did not warrant any investment or time and money in good staff, good timing, or good training. Second or third rate everything, including salaries, has more often than not been the result in a culture of chronic housing shortage. This deficit in thinking and operation is self-reinforcing toward a high cost in later high turnover and maintenance. All kinds of multiple housing, private, non-profit, and government usually underestimate the importance of the combined effects of the ten aspects listed under Systems-Q.

Q-Inhibitions-2

2. Effective initial operating budgets, especially in social (assisted) housing tend to be mechanically or ignorantly underestimated.

3,4,5. Staff tends to be described, recruited and trained (if at all) only for physical jobs, ignoring the major importanace of communicating with occupants.

6. Printed materials are often second rate or worse, obscure, tedious, crude, domineering or nagging rather than communicating effectively to build attitudes of cooperation among occupants.

7. An amazing proportion of housing management personnel need training in how to talk to people. Past housing shortages have led to assumptions of inevitable demand, conducive to indifference to occupant orientation, attitudes and interests.

8. In line with a sort of crisis psychology, little is done usually to encourage inform new occupants regarding community resources, management policies and physical maintenance needs of the development.

9. Move-in scheduling is often done or appears to be done in the most indifferent, casual or careless manner with resulting negative effects on occupants. Part of this relates to the unreliable scheduling of construction.

10. For economic reasons, occupants are moved in as early as possible, often in the midst of much terminal confusion of construction. There appears to be a widespread problem in forcing contractors to complete the last 1 to 5% of their specified work. This will often lead to damaged tenant relations no matter what the reason.

Q-Corrections-1

1. The goals and quality of management (operation or occupancy) should be well considered in the planning stages, before design and start of construction. Procedures should be quite fully worked out, personnel hired and trained well before the first new occupant moves in. A longer term investor point of view leads to a policy of slightly more investment in a good start, which is actually a competitive advantage in the longer view.

Q-Corrections-2

2. Initial management budgets should give detailed and full attention to social and psychological aspects. This is a small investment of major value.

3,4,5. Staff needs to be carefully trained in how to speak with, write to and work with people. Results can be impressive from only a small effort in this direction.

6. Printed materials should be carefully prepared, reviewed and tested with an eye to actual communication of fact and feeling.

7. Face to face interviewing is of a high order of importance so that all staff should be trained and supervised in this, including especially maintenance staff directly responsible for people (customer) work.

8. Handbooks, and newsletters easy to read, attractive and genuinely friendly, should provide information about community, management maintenance and individual responsibility. Not, as seen in one case, "Merry Christmas - don't forget to pay your rent on time".

9. Careful move-in scheduling and staff attention to have dwellings fully ready is an excellent investment in long-term goodwill and better use of community and property. Extra staff during the move-in period to prepare dwellings, remove trash, set an adequate standard of appearance in and out of housing is fully justified in the long-term budget.

10. Delays, completion problems by contractors or beyond control of owners and management of multiple housing should be explained to new occupants, as part of building a mutual trust and sense of reasonableness among all parties.

Q-Research-1

Interview, investigate, and report on a number of developments in each of a small number of metropolitan areas as to the extent of staff, time and funds devoted to planning pre-occupancy management. When did this planning, recruitment of personnel and training take place? What were the results, did they appear worthwhile and how related to the funds invested? How did this rate of expenditure become determined? In relation to the extent of the housing market? Interview a sample of occupants of sale housing, public housing, service

Q-Research-2

housing and luxury housing as to initial actions by management, orientation, first contacts in the building and community, work which was well done by management, items which could have been done better by management. Evaluation of management or owner's sales personnel by the occupants of the housing, both positive and negative. From these test interviews, develop a means of evaluating plus and minus occupant attitudes toward management. From test interviews with managers or executives in sales organizations, evaluate plus and minus factors in attitudes, preparation and supervision of management (owner) personnel.

Q-Performance

The effects of a good program of tenant preparation and rentals, staff selection and training is difficult to evaluate exactly, but it is felt that certain measures can make this worthy of performance evaluation. One is the construction and management of a model or plan for recruiting and orienting staff, communicating with the potential market, interviews and actual rentals, and then occupant orientation before, during and shortly after move-in.

Under the head of communications, there is the quantity and quality of printed materials and interviews by staff. In regard to staff preparation, there is the clear organization of duties, job descriptions, table or organization, and a general plan for functioning. A critical measure is the length of rental fill-up period. In some cases, it has taken one to two years to fill a new development, whereas, on the other hand some developments have been fully rented before completion and the first day of occupancy. Another measure is the extent of turnover during the first two years as a possible indicator of occupant dissatisfaction, partly as a result of poor communication as well as external factors and price.

It is felt from the experience of the writer, that a carefully planned preoccupancy program is an excellent investment in the long term welfare of the community, the property, and if absentee owned, the investment of such owner. Performance here is also a matter of evaluating social and feeling factors. In spite of intangibles, measurements in this area are becoming increasingly effective. Morale, knowledge and subsequent actions can be measured on the part of whole communities.

R- COMPLETION OF CONSTRUCTION, AUDIT AND CLOSING

This period may last from three to twelve months after 95 to 99% completion of construction and through first move-in to full or substantial occupancy.

Responsibility to and by sub-contractors

Delay, string-out, - call-back problems

Interference with management and occupancy by completion of construction.

Extra costs to all parties

Long delay in final payments to contractors

R- Inhibitions

1. Delays in completion of even very small items appear to be increasingly the order of the day with an excessive cost to all parties. Large amounts of unnecessary time appear to result from this aspect of frequent disorganization of the building industry. Single operation corporations (some contractors have many) go into voluntary bankruptcy, sub-contractors leave the job and cannot be forced to return or do so only after great delay. Supervision by the general contractor is removed, other jobs are started, executives cannot be reached.

   Accounting, paper correspondence, reports and cost of interest continue. Analysis of the flow of large building work would show a foolishly high cost for this terminal disorganization.

R-Corrections

1. Tighter controls, sanctions, legal back-ups often are needed to obtain prompt completion of punch-lists, missing items, small sub-contract wind-up work and clean-up. It is reported that time penalties in contracts are seldom enforced. Perhaps they should be, since the long and frequent delays in these last, relatively small items are a heavy cost to both contractors and owners (and often occupants).

   Use of deposits, security, hold-back funds and competent bonding companies should apparently be more widespread and tightly administered. All of these negative aspects appear closely related to the fragmented, ballooning and collapsible character of much of the building industry. The more competent, stable and larger elements often build only for their own account or in some cases on a cost-plus basis among organizations that have mutual confidence or interlocking interests and controls.

R- Research

In a sample of large developments in several metropolitan areas, from interviews with owners and builders, estimate the lapsed time for completing the last one to five percent of construction. How did this relate to occupancy? What extra costs were reportedly involved in regard to the contractors and wind up of work?

R- Performance

While measurement of performance under this heading is similar to that of P. CONSTRUCTION, generally, there are nevertheless special features and problems which frequently appear. Evaluation here would include the length of time for the last one to five percent of the development, the extent of nuisances to incoming occupants, the carrying out of architect's punch-lists for final replacement and wind-up work. Related to these are the extent of proper control of final pay-outs to the contractor and architect. There is a great deal of lost motion in the completion of many new construction jobs, together with repairs and replacements for items lost, in error or stolen. So much of this phase of cost appears unnecessary in a well run job, that it is worthy of special evaluation against a standard of proper performance.

S-INITIAL OCCUPANCY

The term is defined here as from first occupant to 95% occupancy plus the first year.

Reserves from capital are often needed to meet unforseen costs

Occupant example, guidance is most timely

Standards, communication in management have most impact

Mechanical problems, discoveries of shortages and errors, paving, parking, dust and mud, initial repairs and replacements.

Staff - Training in operation

Establishment of record keeping

Community formation

Communication - newsletter - handbooks - posters
Staff influence and follow up of initial and special problems
Manager visibility, role playing and leadership by residents

S-Inhibitions-1

1. This period from first occupant to 95% or more of occupancy and the first full year of operation, is often marked by discovery of deficiencies, repairs and adjustments which are not repetitive such as balancing heating systems, cleaning out drains accidentally blocked during construction, freezing of improperly protected pipes and similar one-time surprises.

   Such extras beyond regular annual operations and budgets in addition to lacking preparation, are often unbudgeted. The importance of establishing a pattern of careful and communicative administration in this first year and a half is usually underestimated. Hostilities, misunderstandings, bad patterns by residents and staff are sometimes developed and are <u>far more difficult and costly to undo</u> than to have done right in the first instance, just before and during their establishment.

These include attitudes toward each other, management, commercial, service or public, disposal of wastes, outer appearance of houses and grounds, maintenance and improvement of interiors, handling of information complaints and services.

S-Corrections

1. Supervision of staff in accordance with clear, positive objectives is of central importance. Sensitivity to formation of a sense of community, order, pattern and lines of communication is of much higher importance than often grasped by minimum management.

   Budgets for the first year and a half in the form of a sufficient reserve included in initial capitalization is important to immediate corrections of discovered deficiencies. Initial staff recruitment, orientation, training and development in action has a higher cost which should be planned for. Staff turnover may be higher in the first year or two.

   Attention to communication with residents will be more fruitful during this "shake-down cruise" than in subsequent years. Home calls right after move-in and a follow-up in a few weeks is well worth the investment, especially where tenant maintenance is encouraged.

   Detailed record systems should be put into operation, especially on maintenance of properties. Forms and procedures should be as simple as possible yet adequate to spot major problems or changes. Service requests, work orders, work measurements are valuable records for summarization and evaluation in large housing developments.

   This is the most crucial period of community and attitude formation. The residents will decide much of the future of the new community. Staff should be aware of their opportunities and role, use it wisely to aid in establishment of positive feelings, participation, healthy process, leadership, decision, new institutions. The manager has a heavy role whether he is aware of the strength or sense of disaster he spreads. He should play it with restraint and sensitivity, and hopefully, consciously.

S-Research

Interview a sample of residents in low income and moderate income housing as to their pre-occupancy orientation and relationship to initial occupancy experience. Choose developments and residents where occupants moved in during 1966 or 1967. Again, what is the evaluation of the management role by the residents and the evaluation of the residents by the management.

S-Performance

This period too has its special characteristics which are worthy of measurement in order to describe a proper job for the percent to which a particular job has been brought. There is skill in scheduling move-ins, good communication, a minimizing of various nuisances and an early correction of errors in construction.

Training of the staff in actual operation, supervision for the carrying out of tasks, establishment of record keeping are part of this phase. Equally important but much less attended to, is a deliberate program building a sense of community and satisfaction in the housing. This work includes a variety of kinds of communication through written materials, staff and neighborhood. This period has extra expenses and special starting problems which are worthy of extra attention. It may be described as the first year after the first tenant moves in or up to ninety-five percent occupancy, or perhaps a slightly longer period until matters are on a fairly routine and level keel. It is observed that the performance here in many public and private developments is much less than satisfactory, mostly unnecessary, and apparently relating to indifference or insufficient thought and planning at an earlier stage. Sometimes, the background attitude is simply one of "why bother?" when there appears to be a good market anyway.

T- FULL OPERATION

1. Community relations
   Occupant guidance
   Neighborhood morale
   Resident responsibility, goals, organizations

2. Community facilities, in, or adjacent, services, participation.

3. Measurement of Community -

   Livability
   Turnover and Replacement
   Adaptation and Positive Response to Change
   Voluntary Improvement, investment
   Vandalism to people and property
   Feeling indices, positive and negative

1. Community Relations: The disturbed, overhostile community can be sensed, seen or measured in various ways. Causative factors are more difficult to evaluate or assign a scale of weight. High mobility may be both a cause and an effect of negative feelings. Acceleration of change, sudden change or fear of change will contribute. Excessive social monotony on one hand or distance on the other, among different recognizable groups may cause or bring out existing tensions, bad construction, sloppy maintenance by owners or tenants may be both cause and effect.

   Poor communication, exaggeration, rumor, with or without destructive intent, is one measure of poor community relations. The extent of responsibility taken by residents for their own behavior and property is another significant measure of the state of morale. The approach of management is often grossly inadequate in both understanding and performance in regard to communications, role-playing, guidance, morale building, development of resident responsibility.

   The structure of human attitudes, initiative and responses is the most real and powerful force in the community, even though intangible.

2. Community facilities for direct service and as part of development of a sense of community, are often inadequately planned or not at all in new communities. In addition to the obvious gathering places of business, schools, playgrounds and stores, there are many less obvious points of activity and communication. Small open spaces, vacant lots, greenways, bus stops, bodies of water, commercial athletic centers, are all part of these communications and informal points of congregation, for adults as well as children. In addition there are newer kinds of facilities which still get less attention than deserved such as nursery schools, art centers, theatre and music centers, free construction playgrounds, multi-purpose facilities, active junior museums, a wide range of opportunities to increase response and responsibility. These are frequently not given adequate throught in planning and operation, although in later correction new communities find and establish many of these informally.

3. Means of measuring community viability have not received much attention in actual administrative processes (though discussed in cultist or esoteric academic publications). Such means of feed-back to planning and management are doubtless low on the value-scale of the culture, but in view of evidence of tensions, social disorganization and destructive tendencies, are seriously deficient as a real and used tool for further development.

4. Turnover is one foremost measure of community attitudes. Internal and external reasons can be differentiated as can positive and negative causes. Abnormally high turnover however can often be closely related to poor morale, hostility and poor functioning of community.

5. Maintenance Recording is often not at a satisfactory level, or sufficient to sound long term budgeting. Pressures of the accounts for this year, affluent returns or deficient returns, often suggest a cutting or elimination of recording as to just what is happening in maintenance. An investment or long-term view indicates the value of time analysis of all maintenance work and materials, costs, factors and evaluation.

6. Replacements are often not planned for, or budgeted realistically. Different accounting methods often reflect tax objectives rather than accurate description, most serviceable for operations.

T-Inhibitions-3

7. Resident Responsibility, delegation, is often underestimated as a force in multiple housing, new and old communities. Neglect of this objective has lead to neglect of real opportunities for work with renters, even in self-help in painting, ground care and minor repairs. The increase of rights in property, and widening delegation of such responsibility was a vigorous force in breaking up highly centralized feudalism. Antipathy to some chaotic and obstructive present day results of irresponsible individual ownership has sometimes led analysis to overlook the positive aspects of some delegated or partial responsibility even among tenants of multiple housing and large new communities. Cooperative methods and objectives are often not known or used effectively.

T-Correction-1

1. Community Relations - A people-centered and serving society should give far more attention to the structure, base and life of community relations than a survival or extractive oriented culture. These real and often decisive questions which include feelings and treatment of questions of race, age, status, mobility, anxiety and alienation, should be built into conceptualization, physical planning and management of communities, new housing, suburb, revitalized neighborhood or new town. They obviously do not just take care of themselves or go away if everyone has enough bathtubs or TV sets.

2. Community Facilities - Outlines and check lists for defining, measuring, and evaluating the physical facilities, their space, actual and potential uses and quality or obstacles, is a vital part of mature guidance of operations. This includes adjacent spaces used by residents of defined physical communities, new and old.

3. Measurement of Community Viability - Development of measures of health, adjustment, survival value are long overdue. Why does one neighborhood become hysterical, violent or flee in the face of slight racial or religious change and another adjust and survive, and even flourish? Scales for measurement and evaluation should include

   (a) turnover and replacement

   (b) response to change

   (c) physical maintenance, appearance, waste, vandalism

(d) evidence of frustration and hostility

(e) acts of personal social disorganization

(f) acts of response, re-integration

(g) extent of participation in existing institutions

(h) formation of new organizations

(i) voluntary improvement and new investment

(j) emergency or rigidity of leadership and its style

(k) adequacy of the decision making process in the area and its organizations

4. Turnover should be carefully analyzed from time to time by brief interviews of move-outs and impartial interview in more depth on a sample basis from time to time. It has been found that actual grounds for dissatisfaction (apart from external physical changes in employment and family) may be obscure to the family or complex and not frankly stated. Valuable clues to community relations and viability can be discovered by these means.

5. Thorough maintenance recording is a vital tool for sound long-term investment, even though often not seen as profitable in the short run. Analysis can be a real help to budgeting and policy decisions, resulting in the difference between control of work and budget and simply chasing erosion crises. Records of ground work, utilities, painting cycles, waste disposal, repairs by dwelling unit, will give clues to present or incipient problems of people or plant.

6. Long term replacements should be estimated, re-measured from time to time, budgeted for, seen as a part of the life-cost (combined construction and operating costs) of the item and and the total community. Financing programs to aid low and moderate cost and income housing (assisted to lower original or operating costs) should take such replacements into account, since their omission may sharply increase operating costs. Example: Coal-fired heating systems had to be continued in public low rent housing in Philadelphia for years after it was clear that they were excessive in cost and that replacement would be highly justified.

T-Corrections-3

7. Resident Responsibility - This is a fruitful area for improvement in the present inflationary situation, but good at any time to increase the sense of participation and community, lower costs, and better maintain the physical plant. The writer helped to institute programs of tenant interior painting in two large city housing authorities where some management in each agency was initially dubious or opposed. Monetary savings were substantial in both cases plus believed improvement in tenant-management relations and other maintenance. A garden center and wide program of tenant planting, embellishment and grounds care, was highly successful in another development. A carpenter shop with tools resulted in better fences, furniture repair, toy manufacture, help to nursery schools. A cooperative maintenance sharing and rebate plan was forestalled by Pearl Harbor. A tenant-written newspaper, town meetings, community council all appeared to relate to better morale, maintenance and rent collections.

   The cooperative method of incorporation, ownership and management, has been found to result in lower turnover, maintenance and other operating costs, more responsibility, and in some, more satisfactions, lower costs, a better community. This cooperative form, closer to ownership than transient tenancy, appears a strong administrative means of accomplishing positive housing goals, both social and financial.

   It is hoped that better physical plant (architecture and motivation by both client and architect) can result also, and should, when more seasoned cooperative sponsor groups can acquire increased competence in planning, design and operation, and financial strength.

T-Research-1

Develop measurements for community viability with both subjective and objective measurements. These should include turnover and replacement, adaptation and response to change, extent of voluntary improvement and investment, or vandalism and damage to people and property. Indices of feeling both positive and negative, should be developed in cooperation with the most highly skilled interviewing professionals.

Use these measures in several new communities of varying physical types and income levels, racial and religious mixtures. List also the extent of community facilities in or near these new communities, the reported extent of their use and feelings about them and the actual figures on their use.

T-Research-2

Measures of social health should be developed just as much as health of individual organisms.

Examine a small number of large scale developments with common ownership, rental or cooperative, especially in regard to a recording of maintenance work, estimating cost of labor and materials, extent of management maintenance, extent of occupant maintenance and trends therein. The Housing Assistance Administration within HUD should be able to identify developments which have the apparently best community morale, maintenance and rent collection, as part of positively oriented housing authorities and also some authorities and projects which appear to have the poorest community relations. Try to identify causes and factors.

T-Performance-1

This is a complex and often intangible and difficult to reach kind of measurement. However, it is real and it exists, and measures can be used or further developed. The morale of a housing community is of high importance in its ultimate economic and physical success. If the morale is poor, such anxieties and hostilities may largely negate the results of careful financial work or adequate design and construction.

In short, a successful operation must include satisfactory standards in the social, physical and financial areas of measurement. Good performance means a sum total of all three of these. This is felt to be so important that a more detailed outline follows. These items in description of a particular housing development or small community are only listed herein to give clues as to the scope of such a study. Each item requires careful definition and means of measurement. Such a study would include interview with management personnel and a valid sample of occupants.

FACTORS IN EVALUATING "SUCCESS" OF A LOW-INCOME HOUSING PROJECT

I. DESCRIPTION

Description of Occupants

Family size, number and age of adults and children
Absence of man
Employment occupation; other source of income; stability of income

Description of Units

Stories, size, storage, number yards, doorways on block or court

Inter-Project Reactions

Community organizations
Facilities, activities, for whom in theory, and who actually comes?
Informal meeting places
Doorway design, walks, parking and neighbors

Fringe Factors

Character of thrusts in neighborhood
People, services, transportation
Race, income, housing, stores, facilities

II. KEY INTERVIEWS

Neighborhood Leaders and institutions (a small number)

Manager and Staff

Tenant reactions to, practices, communication

Housing Authority Policies

Rent changes
Tenant selection
Evictions
Tenant relations to central office
Two-way communications

III. 10 - 20% SAMPLE

Tenant Interview - purpose, future
Rank factors and number--positive and negative grounds -
Neighborhood - as a selective factor
Staff behavior
Authority policy -
Size of development
Neighbors and their relations
Unit and its services
Community Facilities on project
Mix of sizes of units
Effects of physical design -

Objective Measures

Turnover
Maintenance types and costs
Appearance
Vandalism
Rent collections
Noise and complaints
Crime
Social disorganization
Rent collections

U- SCATTERED AREA EROSION (URBAN)

1. Physical factors

Traffic	Change of uses
Smog	Obsolescence, parking
Noise	Open space (unsightly or corrosive gape)

2. Social - visible over-crowding, accelerated rate of change. Status anxiety, change in group, age, religion, at a tension-producing tempo.

3. Economic - lower income groups, lower landlord income, decline in maintenance or all three.

4. Decline in neighborhood morale, sense of community loss of will, fragmentation including negative effects and attitudes by leaders of voluntary associations, small business owners, realtors, institutions. Lessened degree of organizational effectiveness, decision process, response positive; action may be absent or vitiated.

U- Inhibitions-

The other side of the coin of new construction of housing and larger communities is erosion and decline of old ones. Much light on planning of new groupings can be shed by analysis, and hopefully understanding, of the causes of decay of middle-aged and old urban residential areas.

This decay is not inevitable since many urban communities in the world appear to contain forces for regeneration over long periods. The United States appears to have created the fastest obsolescence of urban areas anywhere, related probably both to the rate of technological change, social, physical and economic molulity on one hand, and on the other possibly social weaknesses, inherited value systems which contribute to the "sandpit" theory of the city, and confusion of objectives.

The fact is that many neighborhoods and communities disintegrate at a rate far faster than only physical obsolescence or wear would indicate.

1. Physical Factors

a. The automobile, traffic, noise, danger, smog, parking, desolate appearance of asphalt unrelieved, are often major first factors in resident dissatisfaction with an urban area.

b. Air pollution, smells, smoke, dust, loss of visibility, eye irritation is an increasing factor.

c. Change of uses of buildings and land at an exceptional rate may speed up decline of morale and maintenance.

d. Obsolescence, change of styles, objectives, and increasing maintenance costs may make buildings and land less desirable.

e. Change in Transporation services.

2. Social Factors

These are measurable indices of social change as distinguished from the lively inter-actions or failures to act in 4 below. Included are such measures as:

a. Change in age groups, failure of normal replacement and excessive out-migration of young families.

b. Change in ethnic and religious groups, popularly believed to lie closely related to other changes listed.

c. Overcrowding in the same dwellings.

d. Change in institutions, lessening of services, quality of services.

e. Increased social disorganization, crime, delinquency with mythological exaggeration or pragmatic sensitivity to such dangers.

3. Economic Factors

a. Change in quantity, type or pay of employment

b. Lowering of property values because of previous factors, lessened demand for housing

c. Replacement by lower economic groups

d. Change in number, types, services of stores or feelings of inadequacy of commercial services

e. Availability and competing prices of housing elsewhere, facilities and attractions of other areas, low down payments (FHA-insured) in the suburbs.

f. Lower landlord income, decline in maintenance, increased conversion to smaller dwellings, leading to further decline in maintenance and appearance, increase of negative factors.

4. Disintegration of Social Organization

a. Decline in neighborhood morale, feelings, expectations

b. Erosion of sense of community, self-worth and family goals

c. Fragmentation, poor communications, conflict

d. Negative vocalization especially by most active communicators, realtors, small business, clergy, service workers, as well as residents.

e. Decline of effectiveness of existing organizations, number of members, activities and participation.

f. Failure of response, initiative, new programming, successful actions.

U- Correction-1

1. Physical Factors

a. Automobile - control of traffic and parking, planning and action at effective scale and tempo in area and region.

b. Air Pollution - effective metropolitan laws, action and will, research, action by government and commercial organizations.

c. Change of uses - Review and enforcement of housing and other codes, zoning, demolition and land banking where deteriorated uses are unsound or uneconomic.

d. Obsolescence - Search for new desirable uses or research and action on processes which will speed up re-use of buildings or land.

e. Transportation - Firm support of public transportation, modernization, capitalization to lessen destruction by automobile.

2. Social Factors - Improved research, check-lists, measurement outlines for self-evaluation of facts and trends. Correction lies in the democratic process and response to change.

3. Economic Factors

a. Change in employment - may be necessary. Alternate new investment and employment can be guided and encouraged by public policy.

Example: Philadelphia Industrial Development Corporation.

b. Lower Property Values - Programs to improve both neighborhood and houses through city services and agencies, business and housing occupants self-help and parallel or joint financial re-investment.

Example: Queen Village, Philadelphia; $75,000, seed money made possible $300,000 of rehabilitation by a neighborhood-based non-profit corporation, which in turn helped to induce $1,200,000, of recorded improvements by home owners, businesses and institutions.

c. Replacement by lower economic groups - Measures of adjustment, communication and economic progress on this historic highway must be detailed, communicated, used.

d. Change in Stores - Analysis and deliberate action as described under 4 below can speed up improvement of existing stores or attraction of new elements.

e. Availability of housing elsewhere - Competition of neighborhoods is a fact. Existing neighborhoods have many advantages, often under-used. Like wives, they are there,

but sometimes could do much better. Location familiarity, warmth, possiblity of creative response are often much stronger in existing neighborhoods.

Example: West Mount Airy, Philadelphia, suffered from serious obsolescence, price decline, white flight after Negroes moved in. The creation of a neighbors' organization, good structure of houses and land, improved transportation, and will of leadership group, all helped to create a vital organization, active programs, stimulated the latent housing market, raised prices, eliminated vacancies, naturally aided inter-racial and self-regenerating forces.

f. Conversions - can be halted by code or standards of physical change, and occupancy controlled by public inspection and enforcement. Landlord income is usually ample until the last stages of building and neighborhood disintegration. Some of individual tenant problems can be helped by landlord fairness, social action under 4 below, or social services or combination of these and economic measures such as guaranteed minimum annual income.

4. Social Organization - This is the primary area for initiating counter-action, new vitality, response and action programs.

   a. Establishment of goals, hopes, immediate targets.

   b. Identify assets and potential of community

   c. Improvement of communication

   d. Strengthen existing organizations, add some new wine to old brew and empty bottles

   e. Positive education, training, publicity

   f. Develop new response, initiative, participation, leadership, decisions, programs, actions.

U-Research

In a small number of cities, middle neighborhoods which are just beginning to show signs of erosion should be investigated in detail on a careful interview basis with residents, businesses and institutions. A sensitive system of attempting to evaluate the real reasons for neglect by occupants and users, out migration, failure of new investment, ideas and actions, should be made. The relative weights of various negative, social and economic factors should be developed, tested, and retested in order to develop a viable tool for use by cities. City planning and development programs can then make use of such a keen tool in programming their own varied operations and estimating the benefits from various expenditures.

U- Performance

It is felt that performance of a neighborhood can be studied and is worthy of evaluation. A planning commission, city or metropolitan should develop keen sensors in order to discover and measure the beginnings of erosion. The key measurement here lies in the means of discovery and evaluation of warning signs that a negative process is beginning. Much research needs to be done on the actual origins of slum manufacture because, unfortunately, economic and racial change which frequently is the most visible sign of slum formation, may be the end result of a long process and certainly not the primary cause, although related to later conditions.

The evaluation of neighborhood performance at the early stage of negative indications includes the steps of observation, interview, assigning of relative weights to different factors, measurement of each factor to the extent possible and finally, evaluation of all information collected.

Some planning commissions have tried to over-simplify the matter by making vast tables showing the tax assessments by blocks, or residual value of properties, or only the number of dilapidated units, or the age of units. Each one of these factors by itself may be quite misleading as clues under certain circumstances. This area of evaluation and setting up a standard for performance is one of the least explored in the whole process of developing, using and reusing housing and housing communities.

V-INTERNAL CHANGE OF HOUSING

Change in age of occupant families, size, functions

Change of economic status of occupants.

Mobility of employment, that is, out.

Change in maintenance skills.

Lowered maintenance, by choice, lowered income, or increased

Change in age of people, in attitudes of individuals in the neighborhood and property, from positive to indifference or hostility.

Abandonment of lots, houses, commercial structures.

Failure of replacement within families and their houses after aging, illness, death.

Failure of commercial enterprise to work with occupants, maintain properties, to re-invest to keep them sound.

V-Inhibitions-1

1. Lack of motivation of families to spend labor, time or money to do repairs.

2. Lack of knowledge by families of suitable financing for repair, replacement and improvement. Some who want repairs are robbed by over-active salesmen and fine print, or outright fraud.

3. Lack of ability of families to get financing, credit, capital, or income.

4. Inadequate housing codes not relevant to actual present problems.

5. Weak enforcement of codes, in motivation, corrpution or under-budgeting.

6. Lack of capital in hands of a unified city housing department to do necessary work to continue the justifiable economic life of housing.

V-Inhibitions-2

7. Lack of adequate management to connect with tenants, carry out work, encourage proper maintenance.

8. High cost of small-scale, irregular, irresponsible, high overhead, rehabilitation "industry" of many small contractors with little credit, few steady staff, weak estimating, high risk, pressure to over-charge.

9. Inadequate legal, economic and administrative means to assure a steady flow of acquisition of "anti-social" housing and lots sufficient as a base for existence of responsible rehabilitation firms.

10. Inability to relocate families from sub-standard dwellings requiring demolition or reconstruction (and hence relocation). This clogs and slows down all enforcement, improvement and saving of the existing stock of housing. This appears likely to be an increasing obstacle with the coming housing crisis.

V-Corrections-1

1. Community organization and education programs for home maintenance, with tenants, occupant and absentee owners. Stressing of health, safety, sound investment, comfort, pride.

2. Neighborhood offices, with materials, programs regarding available financing as in federally-aided neighborhood conservation. Title I loans from savings and loan associations insured by FHA, informational campaigns by unified city housing departments.

3. Low interest programs, (3%) for purchase, reconstruction or rehabilitation, by means of public or non-profit acquisition of deteriorating houses in order to do repairs under control and positive management.

4. Review and re-drafting of housing codes to be effective in the present scene.

5. Leadership, clear responsibility, targets, proper budget and staff organization for code enforcement.

6. Establish city revolving fund for acquisition of end-of-the-line houses. The investment should be recaptured by sale, rent or lease purchase, in connection with a city land bank.

V-Corrections-2

7. Use of neighborhood, district or city non-profit competent management corporations, where commercial (short term extractive or investment types) enterprise has failed and is seriously injuring the general welfare.

8. Public and non-profit aid to creation of a competent, reliable, moderate cost rehabilitation industry through steady supply of short-term capital, proper writing of standards and specifications, steady labor supply, adequate flow of acquisition and work.

9. Establish a city-backed land bank to acquire vacant shells and lots, or substandard occupied dwellings when they come on the market voluntarily or are under the hammer of code enforcement. This will become increasingly necessary in large and medium cities to acquire, improve and re-use the end failures of the urban housing system. Such a program will actually, by re-assembly, have great economic and social returns and help make viable the present economic choice system of property use.

10. Use for relocation of families a wide variety of assisted, owned or controlled housing, new and rehabilitated, to allow a pipeline of steady work in rehabilitation of homes and neighborhoods, including scattered of fill-in new construction.

V-Research

Middle-aged neighborhoods where change is accelerating but has not reached a level of general decline or stagnation, should be examined in regard to objective changes. Sales, turnover in schools, lessening of institutional membership, all possible indices should be obtained for evaluating the actual tempo of decline in older neighborhoods. This will be a basis for later assignment of investment by municipalities, in order to inhibit the directions of such negative factors in various kinds of neighborhoods with varying degrees of changing factors.

V-Performance

The census every ten years and the tract and block statistics which come out much later are not sensitive enough indexes of this downward phase of neighborhood change and performance. However, it is clear that much goes on inside of houses which is part of the deteriorating process, and much of this before external signs of deterioration appear. Various kinds of clues and measures should be attempted on a more current basis. The trends in school enrollment

are certainly one. The number of mailboxes and doorbells at the front door of tenement houses is another set of clues, much of this formerly without benefit of formal permit and city procedure. Over occupancy of existing units by sub-letting a room or two is more difficult to discover but might be estimated on the basis of small samples.

Other changes might be measured such as trends in the issuance of food stamps, the number of aged listed with neighborhood institutions, and signs of external dilapidation to houses such as broken windows, lack of curtains, failure to repair front steps, to paint doors or to paint brick.

This is an effort to measure the performance of the houses alone within a neighborhood in relation to changes among their occupants and standards for occupancy and maintenance. It is recognized that such internal changes of housing may in part be results of other factors and in themselves may be causes for further neighborhood deterioration. Factors relating to these causes and effects are worthy of inclusion as part of the measurement system.

W-SUBSTITUTION OF TYPES OF USE

Obsolete uses apparent or declining such as harness maker, small stores, stables, loft buildings.

Change of uses, such as former small stores to gypsy residences, storage use, other uses which increase deterioration.

Concentration of unattractive uses, such as junkyards, paint, trucking, slaughter houses.

Old commercial or industrial buildings changed to rag and paper collection, storage.

Vacant lots for storage, unsightly fences.

Institutions begin to abandon an area and their special purpose buildings further decline, often obtaining much less desirable residential or other uses.

W-Inhibitions

1. General economic decline of an area leading to down-grading of uses with a further cycle of deterioration of residential desirability.

2. Lack of community sense, institutions and associations to resist and expose illegal conversions or procedurally proper attempts to down zone properties (from the residential point of view).

3. Pressure from the wider area for residentially undesirable uses such as junkyards, taprooms, gasoline stations, commercial and storage, trucking, nuisance manufacturing, etc.

4. Empty old commercial buildings because of obesolescence or dilapidation available for lowest economic uses.

5. Increased demolitons by choice or accident with increased vacant parcels, available for residentially undesirable uses, poor maintenance, nuisances (trash, abandoned cars, fire hazards, etc).

6. Abandonment of an area by institutions, churches, special schools, city-wide services that can exist elsewhere.

1. Injection by special forces of new uses, residential or others not harmful to residential use.

2. Organization of persons with an economic stake in the community, i.e., business, professionals, institutions, property owners to watch efforts to change uses, legally or illegally, raise funds, develop procedures to review all efforts at zoning change, resist the undersirable ones. Example: Queen Village, a formerly declining part of South Phila., formed a neighborhood corporation and association brought together 10 churches, settlement houses and associations, business, owners and labor. It now watches all efforts at zoning down-grading, opposed the last 10 cases, won every time. Also got the 36-block area re-planned by the City Planning Commission, got the zoning changed from "heavy industry" to residential and groups of neighborhood commercial.

3. City plans must include locations for residentially unattractive uses and city ordinances for such include standards for screening and maintenance.

4. Where commercial uses in old residential areas pre-date zoning, city ordinances, codes and enforcement should carry out standards for appearance, screening, safety and maintenance, including control of smoke, smell, trash, traffic, noise or other nuisances. Even though non-conforming, the commerical structure has the continued right to use but not do unlimited damage to the neighborhood such as slaughter houses with flies, junkyards with rats, storage yards with no screening or weed control, rag and collection without fire control, ground holes without drainage, etc.

5. Most cities need improved ordinances and their enforcement for control and appearance of vacant parcels. There should be the inclusion of prompt city work after due notice, followed by an enforcement lien, and if necessary, condemnation and acquisition.

6. Institutions should develop heightened awareness of their responsibility for neighborhood maintenance and their high potential for leadership in organization, action and results from relatively small investment of time, will and funds.

SUBSTITUTION OF TYPES OF USE

W-Research

A number of fairly deteriorated neighborhoods should be studied intensively as to non-conforming uses, when they started in the present use, and what factors appear to lead to the change in use within the substantially residential neighborhood. Along with this, the number and proportion of empty residential and commercial buildings should be reported, along with abandonment of the area by institutions, decline in organizations and other factors in this near final condition. These series should be carried back over twenty or thirty years in order to evaluate the facts and possible reasons for this negative change.

W-Performance

Measurement of these changes is important as a total picture and especially as a trend forming measurement. That is, the number of dwellings converted from single to multiple use, the number of residences to which small commercial operations have been added, the change in the use of vacant lots and of commercial buildings, are all part of the picture of decline. Much of this can be estimated by a sidewalk count. However, it is important to know how many of these changes have taken place in each of recent years such as over a five year period. These kinds of measurements are particularly useful in looking at sub-areas and in designing conservation, rehabilitation, and fill-in programs. The rate of change should be measured to the extent possible.

X-INTER-ACTIONS IN DECLINE

After scattered erosion and negative factors, internal down-grading of housing, and changes of use, the various changes begin to have a re-inforcing downward effect on each other. This intermediate stage in decline then rapidly accelerates. Down-grading of residential desirability, commercial uses, appearance, and abandonment, all proceed increasingly together. There is a withdrawal of expectations, little new investment. Out migration increases, sometimes with replacement by lower economic uses. Institutions and organizations continue but cease to attract new persons, ideas or programs.

The down-grading proceeds rapidly in this stage and there is little appearance of counter-actions. Morale of residents and business is negative and there seem to be no rallying points.

Mortgage, insurance and real estate organizations are most aware of the tempo and increase it by accepting it, then advertising, repeating and emphasizing it.

Little awareness is shown of intrinsic values in location, structures, land, architecture, tradition. American status anxieties, related to personal and group insecurities, have accentuated this acceptance of decline of "property values" and accelerated it in many cases. Even strong area values, social as well as financial, have been obscured by the compulsive neurosis of personal security and identification based on status.

Heavy financial losses have sometimes been hastily incurred rather than ego losses, "losing face", although profits have been high in some aspects of large turnover or ethnic and economic uses.

In the intermediate stage of acceleration of down-grading and flight, it is most difficult to find positive forces to rally and turn the tide, even when the facts are mostly on the positive side. Mythology often overturns reality.

However, location and communication with potentially positive forces, even during a period largely of flight is a first action. Small numbers of individuals, business,

organizations can usually be located by responsible urban actionists.

Who budgets time for positive work? Settlement houses sometime exist. Welfare workers, teachers, school principals, ministers, doctors, lawyers, small business owners, can sometimes be motivated. However, in the mobile pattern of American centrifugal frontierism, individuals and small organizations are more often overwhelmed by the negative mores and mythology.

Injection of catalytic-type activators, most probably in many instances, come from metropolitan, city or district organizations dedicated to, motivated and funded for such community planning-organization-action programs. The City of Montreal new unified Housing Department (Service d' Habitation) has a division entitled "Community Animation". Such activation must work with residents of an area, communicate with all, encourage the positive elements, describe real opportunities, match local efforts, not supersede or direct them.

Effective marriage of city-wide technical competence able to handle complex planning, financing and operation of multi-phase improvement programs, with local insight, expectations, and will is a new area of service in which few persons have become effective; many more are needed.

Rates of change should be measured for each separate factor, then viewed together in order to determine strategies. New techniques of measurement are needed to evaluate negative forces independently, their tempo, weights in relation to each other and combined effects.

X-Research

In the same areas studied under Section Y, add a section to the study of observable defects of deteriorated commercial properties on residential uses, abandoned or badly dilapidated residential uses on remaining homes in each block; lack of zoning enforcement, appearance of trash, and estimate negative effects of each change on the rate of change of each other factor. These studies should apply to small but intensively surveyed areas of perhaps twelve to twenty blocks each.

X-Performance

The key measurement here is the relating of housing changes to changes in use, abandonment and obvious dilapidation. The rate of change of these different major factors, when placed side by side, will indicate the continuing path of the immediate future and cast light on the scale necessary to reverse the trend.

Here, objective measures may include the amount of play in streets, adequate performance standards for the collection of trash, and garbage, the rate of tenant turnover, the loss of occupant owners and other measures of each of the major factors involved in the vigorous but negative interactions which take place near the end of the downward line.

Y-GENERAL DECLINE

This is a condition of decline of all or most factors, where interactions of Section X have set in heavily. The character of such stagnant and pervasively declining areas is marked by such factors as these:

1. Little or no new investment, particularly residential.

2. Bottom prices or no market at all for residential properties.

3. Tax delinquency increase.

4. Increasing conversions of structures to more congested uses, higher immediate returns to owners, with greater community damage.

5. Actual abandonment.

6. Withdrawal of property insurance.

7. Withdrawal of mortgage funds.

8. Purchase only by speculators or "slumlords"

9. Many lowest economic uses of old commercial structures with highest effect on residential undesirability.

Y-Inhibitions-1

This stage is dead bottom or close to it. There is little or no input, regeneration, fresh investment or new construction. Those most anxious to flee have left, those who remain endure. Lowest housing uses have the old, the sick, the poorest, the most crowded. Time wears down the buildings and the people, dilapidation and abandonment slowly increase.

No will to positive action appears by individuals, organizations or local government. Associations, where they continue to exist, are of the elderly or for intensified competition for waning prestige. Instead of positive new growth, there is sometimes the most bitter, negative scramble for remaining crumbs of power, influence, attention or economic advantage. Commercial elements are indifferent to the stagnant neighborhood; the most extractive seek only short-term gains, or others are coasting such as the little stores of the elderly.

Where positive elements exist, as a specialized commercial block serving the region, an art center serving the city, a church with its ethnically narrow membership, it tries to operate in isolation.

Withdrawal of mortgage funds and insurance is one of the most deadly kinds of abandonment. A well-built large house cannot be mortgaged here by a young couple even at a price, say, of $6,000 but a $15,000 house in a suburb can with only a few hundred dollars down. This is the coup-de-grace that insures only slum use by speculators and multiple property owners who at one recent period expected to return their capital in two to four years. At this rate of return for such investment there seems to be considerable capital.

Another characteristic of this end of the line is the inability of owners to sell the most dilapidated properties at all. Since abandonment is faced between code enforcement on one hand, lack of or unwillingness of capital to furnish new investment, even while taxes and costs of even boarding up continue, owners become ready to give the properties to a public or non-profit agency. Income-tax deductibility helps this new-found generosity.

Y-Corrections

The first step in correction and start of improvement in such an area is an act of will, the decision to do something about it. Some body or some organization has to make this decision.

Second step is review of all factors, trends costs, tempo, with analysis and evaluation.

Third step is establishment of preliminary hypothesis for short-term steps (one to two years) and long-term steps (three to six years). Quantities, sequence, weights, interactions of new inputs are estimated and a target action program outlined.

Fourth is the assembling of forces in, near or out of the area who will agree to carry out new programs.

Fifth is the financial dimension for initiation, testing feed-back, goal establishment and revision, flow of funds for staging of varied programs. Personnel, administration, control measures, reporting within communications without, are vital parts of the operational phase, plus especially constructive involvement to a maximum of all possible positive elements in the area.

Y-Research

Select several other areas in the most stagnant condition in several cities but also largely built up, largely residential and largely occupied. Evaluate the extreme condition of the various factors listed under "systems" herein, such as little new investment, increase of tax delinquency, extent of residential conversions, and actual abandonment, difficulty in obtaining insurance, and mortgage funds and the nature of property transactions and their purchasers.

Y-Performance

Among the principal measures of this phase of the distingration of former communities and uses, is the absence of new investment or construction. Such an area will show almost no permits for new construction and relatively few for improvement or enlargement. The majority of permits will be for sub-division of existing residential units and most likely the down-grading of commercial units. Requests for zoning variance in such bottom neighborhoods will also give an indication that the urban area as a whole regards this near corpse as having no powers or resistence, and ripe for any of the most unlovely aspects of urban civilization such as junkyards, slaughter houses, and the most unattractive varieties of industrial and commercial uses.

Other measures are the prices of houses for sale, the extent of abandonment and boarding up and lack of rehabilitation or purchase even for speculation, the willingness of slum lords to dump their properties by any means, the extent of tax delinquency, and the general withdrawal of property insurance and mortgage funds.

Z-RE-ASSEMBLY & NEW INPUT

1. Random Commercial Investment

2. Commercial Investment with planned assembly for re-sale or assembly for Development.

3. Government Re-Assembly by "Urban Renewal"
   Pre-plan speculation by commercial elements
   Go back to A with heavy demolition
   Plan preparation, goals, factors, tempo, money, cadre
   Condemnation often doubles prices
   Price deflation or inflation of all factors
   Speed up of abandonment during several years of planning, clearance, re-assembly by special organizations

4. Consumer Re-Assembly

5. Policy Questions

   a. Land Banking policies for extended acquisition
   b. Leaseback of land, more controls than zoning, to continue viability
   c. Tremendous delay and special costs of all types
   d. Great public cost vs. benefits
   e. Diversion to powerful political and economic establishments, least in need of subsidy or new input
   f. Creation of special instruments, non-profit Corporations, varied roles, 2 & 3 and 4 above.
   g. Proper and varied roles of 2, 3 and 4 above and their combinations.
   h. Role of value systems of society, housing and wide-spectrum neighborhoods for all vs. automobiles, gadgets, education, military, display and cosmetics, high pressured consumer goods, travel and mobility, welfare, health and social investment.
   i. What will it take to make cities work, produce and keep enough adequate housing at all levels, meet the costs, keep the program and culture politically and economically viable?

1. Random New Input - New input without plan or special organization and effort may happen in parts of a stagnant area for reasons not related to the area except bottom prices. A junk and antique section may grow, a grouping of related stores, a large commercial operation looking only for the lowest priced space. People migrations may lean toward elderly or skid row, welfare families, transient labor, or the curious combination of real and would-be artists, students, dropouts, floaters, coffee-houses, music and crafts. But such coalitions without plan or economic strength and lasting power at scale seldom re-direct the character of the total neighborhood at a significant rate of change. The major inhibitions to effective re-assembly are lack of sufficient will, forces, plans, funds and staged programs.

2. Planned Commercial Investment of sufficient scale and tempo. Commercial enterprise may visualize a re-assembly for a vigorous and profitable new use. However, there are usually at least these factors in operation:

   a. More profitable operations elsewhere, especially on vacant land and in suburbs; (different from tax benefits to city, social and employment benefits, built in efficiences to the whole economy).

   b. Inability to do secret assembly of land, the usual rise of asking prices, lack of power of condemnation of holdouts;

   c. Need for substantial amounts of capital and credit over a long period;

   d. Too long a period before new capital begins to pay a comparable return;

   e. Difficulty in relocating occupants related to past experience;

   f. Continued social disorder all around proposed plan area;

   g. Insufficiency of city services or delayed timing in related improvements in streets, parking, lighting etc.

3. Government Re-Assembly - Enough federally-aided renewal has been done to serve as a base for facts and evaluation. Among the major inhibitions, beside limits on federal funds, are these:

   a. Lack of knowledge or clarity on federal-local procedures for planning, authorizing, assembling, clearing and selling land for development;

   b. Lack of local funds to match federal write-down assistance;

   c. Rapid inflation in land prices through condemnation or otherwise;

   d. Tremendous time taken for planning and acquisition procedures, lack of clear time-targets and controls for scheduling for the many steps in the processing;

   e. Speed up of abandonment of properties and increased dilapidation on one hand, damage and decline over the long planning period, interest costs and price inflation to the government agency on the other;

   f. Capture of redevelopment processes by the most powerful commercial, financial and industrial elements which actually need the write-down on land price the least.

4. Consumer-Oriented Re-Assembly - While broad community and neighborhood participation is desirable and adds many strengths, there are also handicaps frequently met:

   a. Difficulty in agreeing on policy, based on facts and achievable programs;

   b. Lack of knowledge of real choices, after weighing problems and opportunities.

   c. Need for individual competence and self-direction for groups to function, as committees, staff, boards and associations to bridge from motivation to plan to action;

   d. Need for time and experience in working together to carry out programs effectively;

Z-Inhibitions-3

4. Consumer-Oriented Re-Assembly - Cont'd

e. Difficulties in raising capital and credit;

f. Lack of properly motivated and competent personnel professional and voluntary for continued, multi-phase programs combining work with people, money and properties; difficulty in finding, training and holding such people with necessary abilities.

5. Policy Questions

Short-term small scale thinking tends to dominate the field of reactions, research and actions. The large proportion of small private properties tends to color thought, in contrast to the easily recognizable large scale of major industry, transportation questions, public investment in military, space, education-welfare, and foreign policy programs.

There is urgent need to look at housing, development and redevelopment questions at scale and at tempo in the economic , social value, administrative aspects as a major aspect of society and its economy, not a little game of "playing house".

Z-Corrections-1

1. Random New Input

The total of accidental or small new actions and investments in a stagnant urban area can have much greater result when guided by an area plan. Even if no programs by government, non-profit or other specially purposed organizations follow at once, the creation of an approved plan can be a positive force for shaping some of the individual decisions as they take place.

2. Planned Commercial Investment

A unified city administration of planning and development can give better aid to commercial interests seeking to launch substantial new investments. Some leaders in commercial investment are creating vigorous thrusts in developing new city cores. Place Ville-Marie in Montreal is an outstanding example. But most of the strongest financial elements in the United States have sought to use local government powers of condemnation and federal funds for write-down of land costs in order to make massive new commercial planned inputs.

Greater profitability is no secret as a motive, and is useful but has not decisively attracted commercial enterprise into revitalization of older, complex areas, as compared with the mushrooming investment in suburban shopping centers.

3. Government Reassembly

a. A total capital budgeting over at least a six or eight year period, both locally and federally, is needed to evaluate the total policies shown in the listing of all the parts. The conscious achievement of balance of the various investments of renewal in transportation, center city, large commercial, governmental, industrial, luxury-priced housing vs. neighborhood revitalization, moderate-priced and assisted housing, can then be seen in better perspective. Too much of renewal has been seen only project by project, with too little attention to policy of input as seen in toto.

b. Greater flexibility in recognition of local non-cash participation elements may enable limited local revenues to stretch further.

c. Condemnation procedures and relation of purchase prices to previous market costs should be analyzed for streamlining, tight administrative controls, and reduction of payments to absentee investors in particular. Advance buying by speculators from inside tips should especially be controlled.

d. The results of any scheduling certainly appear de minimis. Systems for time planning, supervision and follow-up would certainly seem to be in order to judge from the usual times of four to six years and sometimes ten years before completion of renewal "projects".

e. Good maintenance and occupancy of residential and commercial properties, and appearance of publicly acquired vacant land would appear to be high on the list of responsibilities by local redevelopment authorities to minimize economic loss and damage to adjacent properties and area. Maintenance has often been poor to bad, whereas it should be better than the surrounding depressed area to which it should be an example.

f. Analyses of social and economic benefit, with public exposure to active citizen advisory or concerned groups, should help guide public policy toward the areas of greatest social return. If renewal aids are to go in some measure to already strongest elements, decisions should be made on the basis of stated and known objectives and expected results.

4. Consumer-Oriented Re-Assembly

a. The process of policy formation should be outlined by local agencies of government to aid service-oriented organizations.

b. Workshops, printed materials, candid reviews of all programs and choices, should be held increasingly by seasoned professionals from finance, government and construction.

c. Personnel for this work needs increased recruiting and training in service and in universities. Formal training hardly exists for such work, including consumer-oriented housing finance, planning, development and management.

d. Action is the greatest teacher (if the participants wish to learn). Only more and vigorous action, efforts and mistakes, training and experience in group process can speed up the operation of new service-oriented organizations.

e. Personnel with some motivation, potential competence, must be sought, oriented, recruited and largely trained on the job at this time.

5. Policy Questions

Broad economic-historical research can outline the dimensions of inadequacies of capital flow into housing, differing relations to actual need and effective demand. The role of housing and development in new or old areas to the gross national product, employment and instabilities of the economy in its past and present business cycles can be outlined. This can help change thinking from small-scale, short-term to the actual bulk importance of HARD.

a. Broad and varied land banking is needed to counter the constipating effects of speculation, withholding

a. --- and other than use motivated ownership of land.

b. Cities will increasingly benefit by leasing land for development, not selling it and facing re-development again. Cities will need to capture possible surpluses from price inflation of land.

c. The actual costs and benefits of renewal need candid, competent, objective evaluation, including the lengthy delays, many kinds of damage as well as obvious and secondary benefits. Where will the government, i.e., the public get the greatest bang for the buck?

d. What is in the public, total interest for balance in distribution of redevelopment aids and benefits? Air rights over sick railroads for privately operated sports stadiums? Large pipeline housing rehabilitation for low or moderate income families? Luxury housing or government office buildings? The list is long. Neutral evaluation is needed outside of the present largely closed, self-perpetuating system of federal and local legislation, politicking, decisions and awards.

e. New instruments are sometimes most effective for new thrusts. Special recording and evaluation of such new corporate, non-profit and service efforts should receive high priority even though the number and quantitative impact may be small. Their catalytic effect may be great and growing. The hair-roots of a mature tree are only one-tenth of one percent of the total volume yet the most vital and critical, exploratory element for new sustenance.

f. The question should soon be raised and must be ultimately, as to what proportion of national resources should be allocated to housing and related development, what types of housing, where, at what cost and price and in relation to the rest of the construction industry. If present inherited conditions do not allow it to function adequately in quantity, quality, price or location, or at least some major parts of it, then what changes should be induced in commercial, government and consumer-service sectors?

Z-Corrections-5

g. If the choice sector of the economy cannot function adequately, or functions more and more poorly in housing, some parts of new and more effective mechanisms and combinations may have to be invented to allow use of the technology already available, to allow commercial enterprise, government aids, localities and individuals to take more and better parts in solving the rising inadequacies of finance, construction and operation of housing.

h. Around the questions of housing are the frameworks of planning and decision making for the total environment. Use of land among many uses, since there is no longer an unlimited frontier, will have to be examined and weighed far more closely as the United States approaches a population of 400,000,000 by the year 2000 (the battle between passion and the "pill"), North America approaches half a billion, and the hemisphere one billion.

National policy for urbanization, densities, uses of land can no longer be left to accident, short-term maximum extractions, localized interest, conflicts or fantasy. There will need to be national policy openly arrived at to include use of land, urban development, location of new investment and employment, as well as housing and related facilities.

Z-Research-1

Select a small number of areas which have had substantial renewal with varying in-put of government funds and without government funds. It is meant here to exclude the top price areas such as Georgetown and Washington, D.C. In Philadelphia, the Powelton area, the West Mt. Airy area and the Queen Village area are three where there has been little or no direct investment of massive government funds, but rather a strong act of will and organization to redirect and reintegrate these areas. Neighborhood conservation areas with public funds such as under the fairly recent neighborhood conservation program with Section 221(h) funds, loans and grants for rehabilitation and purchase and new in-put of FHA insurance commitments should be selected also for study. This study might be conducted simultaneously in two or three areas of five or six cities with the same basic list of factors and estimate of weight and ranking of new in-puts and their effect upon reassembly. Massive clearance by Redevelopment is not included in this section.

A similar kind of new investment would be planned commercial investment of fairly substantial scale and tempo where reassembly of blighted parcels in blighted neighborhoods has taken place both with and without massive government intervention.

Z-Research-2

Research and statistics in housing play a vital role. A questionnaire to a sample or board group of cities, such as the two hundred largest, on the extent and location of statistics gathering in regard to city and standard metropolitan area, statistics on all housing, should be collected so that the state of this record keeping can be examined and its relation to policy formation. Thinking at scale and tempo of the actual problem is crucial to progress over the next decade, so that this research into statistics keeping is a part of evaluation of the performance in housing.

A special survey could be conducted in a sample of renewal areas where there has been fairly substantial in-put of government and/or private funds in regard to speculation in vacant lots, abandoned shells and occupied but dilapidated housing. The influence on price over a period of five years or more should be carefully evaluated in order to devise counter measures where the reconstruction of older areas will take place in the future.

Z-Performance-1

A crucial area not often studied effectively is the definition and description of the healthy community. In addition to clues from the preceeding negative phases of community disorganization and decline, there is sharp need for model building and description of the healthy, responsive community that restores and replaces itself.

The model for such performance needs to be described. Against it there can be measurement of existing communities still on their way down and perhaps more useful, at the present moment, a detailed description of communities which hit bottom and began a restoration.

What factors, human, physical and economic reverse the tide? What elements of will, plan, leadership and organization were injected to begin a reorganization, improvement of housing, stores, services and institutions and the beginning of a steady, vigorous up-grading?

Out of such detailed evaluation of a number of existing communities, there can be drawn a general list of factors which have aided a turn to positive reconstruction, the weighting of these factors or ranking under a variety of circumstances. The performance of certain individuals or certain groups as compared with non-performance of other groups or routine performance which was already obviously inadequate can be described and, it is felt, evaluated quantatively to a considerable extent. Such measures and social indicators are urgently needed and is a vital part of a total measurement of strong performance where such older neighborhoods begin regeneration and carry it through steadily. What were the new in-puts, where did they come from, and how effective were each relatively?

Whereas some forces and symbols are clearly of a metropolitan nature, or have some effect throughout an entire local government area, nevertheless, it is clear that much of human decision making takes place in face to face groups or, in the case of housing, takes place within a fairly contiguous neighborhood. The extent of such neighborhoods may be measured by the adults walking or driving to most of the family shopping, the walk to school, to church and playground by the child. Much of the strength in maintenance or improvement, or weaknesses in disintegration relate to these small areas. The evaluator using existing tools, research, concept and measurement, particularly that of performance approached in this study, must at the same time seek to have the eye of the eagle for the broad view, the eye of the head for grasping detail and the importance of the small unit in the total structure.

GENERAL HOUSING RESEARCH NEEDED AS A BASIS FOR EVALUATING USE OF PERFORMANCE STANDARDS

The following observations on general research needs and opportunities all relate to establishment of a performance base for measuring and evaluating results in the development process. However, they are here grouped together in a section with a general approach to research needs to aid in showing their relationships to each other and in toto. It is felt that these areas of information and structure of facts to support theory are essential to creation of an effective tool through use of performance goals, measurement,comparison, ranking, and ultimately action at the scale of the growing problems.

I. GEOGRAPHICAL AREAS

It is suggested that the nation be divided for purposes of housing research at this time into only about four regions; the Middle Atlantic, the South, the Middle West, and the Far West. Other extreme variations in mountain and desert, northern forest or upper New England, are much more specialized and less generally significant.

II. SIZE OF METROPOLITAN AREAS

At least one or two of the largest metropolitan areas should be selected in each region for much of the survey work. Three or four medium sized metropolitan areas are needed in each region, and by way of contrast, two or three quite small ones, under 100,000 population.

III. TYPES OF PHYSICAL CONSTRUCTION

Single house groupings should be selected in each sample where more than two hundred houses have been built in a single year; by way of contrast, one or two medium groups of single houses, that is, perhaps fifty to ninety-nine houses in one year, and one or two small groups of singles under fifty. In addition, large garden apartment groupings should be selected; that is, one hundred to two hundred in a single year, an elevator apartment or two of a hundred or more units; and where possible, what might be called a combined development. This is not quite a new town but certainly a larger aggregation of residential land basically, perhaps combining single and multiple dwellings with some commercial and possible industrial development.

For the most comprehensive of surveys, this would give about a dozen new developments in each of four regions. Many of the surveys can be made of a smaller sample. The most basic analysis begins with a detailed breakdown of cost estimates of new construction or large scale rehabilitation across some such sample as registered above. Each major element should be broken down in as much detail as possible as to the actual on-site costs of each factor, including labor, materials, transportation, land, land

development, off-site facilities, supervision, indirect overhead and profit and interest. This has been done before, but it is worth bringing up to date to see if the proportions have changed significantly from a good group or studies done by the National Housing Administration around 1950, up to 1960 and to date. The trends in themselves might give important indications.

IV. INTERACTIONS OF COST REDUCTION

The next important stage is to estimate the overall effect of reductions, such as ten, twenty, or thirty percent in each of the major cost items above and as they apply to various types and locations of housing. While this is speculative, it does help to indicate the outlines for targets to be sought.

A next important study is the effects of reducing time drastically by ten, twenty-five or fifty percent for construction. This relates to the studies outlined above and these should be made in further collaboration with a small number of sophisticated builders and architects and accountants for builders.

V. THE ROLE OF LOCAL GOVERNMENT IN ZONING, CODES AND PROCEDURES

This should be examined in the same localities, including issuance of permits, inspections or in any other relationship which can be examined through flow charts, systems analysis and detailed time and cost analyses of every step, change and delay. This has certainly been pointed to over and over by builders, and every effort should be made to separate it from some of the intrinsic problems in finance and construction.

VI. ORGANIZATION OF THE INDUSTRY

The number of residential builders of varying sizes in each area and initiating organizations and their proportion of work should be carefully analyzed. It is felt that this is one of the major aspects of restriction on the building industry. After the basic facts are assembled (and many of them are now available in one form or another) there can be intensive review with financing organizations and sophisticated builders to look at possible paths ahead for better organization of builders. Not only size is involved, but the relationship of various elements in the industry with each other, particularly where there are interlocking relations, controls and ownerships. Such factors as advance land buying, control of material suppliers, block buying and any other advantages should be examined under this heading.

VII. DESIGN OF COMPONENTS AND SYSTEMS

A conference was held in August,1967, in Copenhagen, by the United Nations, and it is reported that the proceedings have recently been released on this conference. Many partial examinations have been done on this technical question. It is felt by the writer that the technology is way ahead of the economic and organizational system in this country, so that the technology alone is the least profitable area of research.

VIII. COST IN OPERATION

The starting point here is the cyclical cost of repair and replacement, utilities, wear-and-tear, and the appearance of groups of housing, especially low-cost housing, both public and private. Analysis of trends and factors and rising costs of operation can be done in detail for various types of communities. Physical costs are referred to herein, but underlying social reasons for many of the costs should be studied too.

IX. LIFE COSTS OF PROJECTS

A further concept would be the proper relating of capital cost, interest and principal payments, operating and management costs, so as to produce a total cost per year per unit, per room, per person housed, for the estimated life of the building. This life cost is a total concept which puts into the same equation a high or lower capital cost, with a higher or lower operating cost.

X. SOCIAL COSTS RELATED TO OTHER COSTS

One of the least explored areas is an attempt to reduce actual and observed social costs to dollar and physical measurements. It is felt that a tool can be devised to relate turnover, bad occupant morale, poor communication between management or owners or occupants, hostility among occupants or between occupants and adjacent neighborhoods, to economic costs as well as estimates of psychic damage to those involved, underdevelopment of personality, family life and citizenship.

These are of course closely related to actual cost of operation and life cost of the physical properties. Other social damages may be hard to place a dollar sign on, since they are heavily involved with deficiencies in education, physical health, welfare and social organization. However, an approach to such a tool should be tried in order to highlight all of these costs, even though not exactly measurable.

XI. FLOW OF CAPITAL

A central question in all problems of cost and performance standards is the flow of construction and mortgage financing. The volume, regularity and flow of this element underlies the organization or disorganization of the industry, its frequently poor management and tremendous variability, with high overhead, bankrupticies, and withdrawals from the industry. These economic studies are absolutely essential to the formation of national policy and the necessary setting of effective national goals.

XII. THE NATURE OF SLUMS

While there has been much talk about deteriorated people and deteriorated properties, it is felt that little careful analysis has been done as to the actual generation and the weight of various factors in acceleration of decline of older areas. Many of them are obvious but they need to be put together like all the pieces on the chess board.

This is an important area for study, but perhaps not as important as the central question of the sheer quantity of housing over the next decade. Quantity of new housing will depend upon assembly of land and the flow of capital, the national policy on allocation of resources which becomes a political question. All of these, it is felt, will be paramount over the question of the nature of slums, since outside pressure may increase the slum conditions in some areas and may increase rehabilitation of others. These large economic tides in the near future and a probably growing general housing shortage seem much more timely and weighty than the problems of slow erosion.

XIII. INVENTORY OF HOUSING

Knowledge of the metropolitan housing stock will become increasingly important to the formation of policy. The extent of city housing inventory, machine recorded or otherwise; the nature of tax records; record keeping by code enforcement organizations; and entries of all changes for the entire metropolitan area and its municipal jurisdictions, will become increasingly important. Research and analysis of performance standards should include this phase of understanding of the problems of quantity and quality of housing.

XIV. THE METROPOLITAN DIMENSION

In addition to the extent of housing statistics and inventory keeping, there is the problem of land inventory by acre, parcel, zoning, utility service, recent sale transaction and present use. With increasing use of computers, it should be possible for regional planning organizations to have easily available for public and private use, more and more information which should guide actual development and the formation of policy by individual local governments and by metropolitan governments. This will aid in giving knowledge of advance purchases by speculators, land developers and builders, as well as government agencies and all types of public and private use.

XV. METHODS OF RESEARCH

The most useful kind of information gathering here will be small cadres of top quality research teams in each of the regions, supervising fact-gathering in the selected metropolitan areas. Depth interviews with a small sample of individuals, builders, service housing organizations and local government agencies will be worth more than collection of a vast mass of materials, except in regard to the large economic flows into housing and the total nature of the building industry. For most of the surveys it is felt that personal interviews and recording, together with mail collections, will be the most fruitful.

Flow charts of the process will have some use in part of the analysis. Since, however, the main problem in the future is seen as the total supply of housing, as well as cost and quality, certain aspects have not received heavy attention in this analysis up to this point. For instance, the role

of the realtor as a gate keeper is certainly important to local attitude formation and the guidance of various kinds of families toward or away from various kinds of choices. However, in the total problem of economic development and the improvement of organization and administration in the building industry, this role of the small facilitator is seen as less important although certainly affecting some of the other choices made.

Some of the surveys should be made through national organizations such as the Home Builders, architects and planners. These could be mail samples made within the organization itself, with the blessing of leaders and staff.

Part of the assembly and review of standards is desk work from large materials already mostly on hand. The Department of Commerce and the Department of Labor, state departments and major city governments should have many of the materials already gathered, hopefully in somewhat comparable form. If they are not, this knowledge of absence of data will also be helpful in building the body of information that will point to adequate policy formation.

However, some of the most basic understanding will rise from competent depth interviews and analyses of actual building operations, be they groups of single homes for sale, public housing projects, moderate income or other private multiple developments. Carrying some of the same developments through original cost in terms of quantities, man hours and as many identifiable costs as possible, to present operations and the interrelations between operating and original cost, will be helpful in establishing the criteria, check lists, and procedures for such valid comparisons and weighing of factors.

Perhaps one of the major contributions by a comprehensive methodology would be devising new tools for estimating social relations and physical cost. It is felt that this can be done, as well as that it should be done. Included in this phase, basically of operations, should be the listing of "social needs" as stated in the original HUD letter to the National Bureau of Standards, included in this report*. This should include such factors as privacy for the individual within the family, which relates to size of rooms or dormitory units, number and design of sanitary facilities, number of bedrooms, number and location of storage spaces, the need for individualization in housing and yards which affects the selection of paint colors, the potential extent of self-help, the factors in group living which low-income families are allowed or encouraged to take responsibility for.

However, there is one basic danger in the entire approach of this research effort. The original letter discusses low rent housing over and over again. One of the greatest costs and mistakes of the entire legislative and program assumptions of the last 30 years is that we can move from projectitis to programitis, that is, sorting people out by thin slices of the community rather than looking at the viability of the whole community.

* See Volume One.

The first assumption that low-income families should be housed separately is probably erroneous. There is a certain amount of self-clustering of families and choice by price of houses, including the choices of the middle and upper income groups. However, it is felt that all government programs should have greater flexibility, reach a wider range of income groups and families of various backgrounds to share strengths and weaknesses, to learn to interact, and to build a viable community amid diversity. This is the path which this pluralistic nation must find. The increasing economic segregation by government program may be a disastrous segmentation, with increase of hostility, loss of communication and ultimately increased separation of various deep kinds.

It may be argued that a certain amount of differentiation is valuable for incentive of individuals and families, that difference is inevitable and desirable, in fact, and that it makes for a richer community. All of this may be true in varying degrees, but the increasing sorting out by rigid thin-slice programs may be one of the greatest possible damages to the social structure, with resulting higher cost and poorer performance by all types of new housing, and rehabilitated or older housing.

It can be increasingly seen that most of the problems in housing are not those actually of the bricks and mortar, but first in the attitudes of people, the organization and movement of people; so much so that it can be said, and it is observed by the writer, that the directions and forces of people are in a ratio of 10 to 1 over the physical environment. The writer has observed this in dozens and perhaps hundreds of different kinds of developments and communities.

The second major aspect is that of the underlying economics, which appear to totally override the problems of actual physical construction of the buildings. It is felt, therefore, that performance standards should in no case be limited only to the physical structures, but as it is believed to be outlined herein, should encompass the total conception , financing, construction, and life operation of whole communities of different kinds of houses and people.

PERFORMANCE-BASED SPACE CRITERIA FOR LOW-COST HOUSING

Cooperative Investigation
between
Institute for Applied Technology
of the
National Bureau of Standards
(U. S. Dept of Commerce)
and
Small Homes Council-Building Research Council
of the
University of Illinois at Urbana-Champaign.

by
Rudard A. Jones, A.I.A., Director
William H. Kapple, A.I.A.

April, 1968

INTRODUCTION

The space standards proposed in this report are derived from a careful analysis of the best knowledge of the subject developed to date. In developing them, consideration has been given to three types of information that is available, namely (1) other standards that have been used in the past, particularly those that have been developed by various code authorities, (2) former research work that has been done in the field of space use in dwellings, and (3) other reports concerned with the responses of families to their housing accommodations.

Particular effort has been made to adjust the proposed standards to the specific needs of the low-income group; however, this attempt has been handicapped by the fact that there is not too much factual information on the living habits and family possessions of this segment of the population. For this reason, some arbitrary decisions had to be made, but these decisions were based on the best knowledge available, tempered by the experience and judgment of the writers.

I. SPACE STANDARDS FOR LOW-INCOME HOUSING

Expression of Space Standards

There are several methods of expressing the desirable space standards. These are as follows:

1) space dimensions
2) space areas
3) list of required furnishings
4) clearances and activity spaces
5) combinations of the above

Of the various methods of specifying the amount of space, the area method is considered to be most unsatisfactory. The shape of the room is far more critical than its area. The space allocation for furniture, appliances, and accessories, and the access space thereto can result in different area requirements as the arrangement is varied. For example, size and arrangement of furniture can make a 10' x 12' room totally unsatisfactorily while a 9' x 13'-4" room would be excellent. Following this basic idea, a number of sketches are included in this report indicating suitable arrangements for the furniture that is required. These various arrangements require different amounts of area to achieve their purpose.

Methodology

The recommendations made in this report are primarily based on a list of necessary furnishings, augmented by certain minimum dimensions required for access to and use of the furnishings. In other cases, minimum room areas are specified. It is considered that the most satisfactory approach to the development of useful space standards is through the following procedure:

1) determine the furniture, equipment, and articles that must be placed in the
2) determine the amount of space that is required by the above.
3) determine the amount of space that is necessary to have access to the above
4) determine the amount of space necessary to use the above.
5) determine the amount of space that is required for activities not associated with equipment and furniture.

The difficulty with this approach lies in the fact that there is not what might be called a representative list of possessions, etc., for the low-income population.

A certain amount of this information may be developed on the basis of reasonable assumptions; other conclusions require more intuition and arbitrary decision.

This approach to the development of space standards omits one important item. A certain amount of space is required in a dwelling in order to meet the psychological needs of the inhabitants. Space must be available to avoid the feeling of claustrophobia. It is clear that, while one can sleep satisfactorily in the roomette of a train (probably the minimum individual sleeping accommodation), one would not accept this as a suitable arrangement for a house. Constant living in such an area would undoubtedly create some detrimental psychological affects.

Another major psychological need of the average person is privacy. Ideally, each individual should have a room of his own; however, it is obvious that his need cannot be met where the economic limitations of low-income housing are considered.

Another difficulty in preparing standards for low-income families is the problem of accommodating the type of house furnishings they may have at hand. Authorities have pointed out, and correctly so, that many low-income families do not have the type of furniture for which the housing unit has been designed. Too often the furniture possessed by the low-income family is large and bulky, as this is what they have been able to purchase second-hand, or at lower prices. This furniture is not suitable for the confines of a relatively small house with minimum accommodations. There is no good solution to this problem. If the property is rental property, the property owner can furnish the most suitable types of appliances for the kitchen. For example, a 24-inch range is satisfactory for all but the larger families; therefore, it is useless and costly to provide space for the maximum range of 39 inches. In regard to other furniture that is normally furnished by the tenant, the problem is more difficult since the landlord usually has no control over the furniture that is to be placed in the dwelling. On the other hand, this problem may not be so critical since the most bulky items are likely to be living room furniture and the space limitations in this area are not so precise as in other parts of the house.

II. KITCHENS

FUNCTIONAL REQUIREMENTS

The word "kitchen" is an inadequate name to describe the wide variety of activities that take place in this room of the house. The kitchen receives intensive use by most families; this use is accentuated in low-income families. One source (3)* states:

> "The kitchen is the shop, laboratory, town hall, and general headquarters in public housing. In addition to cooking and dish-washing, it is used for: dining by 89%, entertaining by 25%, children's study by 32%, children's recreation by 52%, clothes drying by 32%, ironing by 82%, sewing by 27%. In addition, it is used for care of the baby, and making general repairs (on household articles and clothing)."

Eating

There are two major types of eating activities which are the primary concerns of the home designer. These are "daily eating" and "guest dining." For low-income housing, the concentration must be on "daily eating." It is not feasible to make special provisions for guest dining.

One point that has been made by nearly all who have studied family living patterns in public housing is that the majority of families are opposed to eating their daily meals in one corner of the living room. They much prefer to eat in the kitchen or in a space closely related to it. Similar observations were made during the Small Homes Council studies of space utilization in the temporary test dwelling.

The demand for an "eating space in the kitchen" appears to stem from two needs. One of these relates to housekeeping.

Dining in the living room location creates a number of housekeeping problems, particularly if the living room is furnished with a rug or a carpet or other type of floor finish that is subject to be stained and soiled easily.

*Reference numbers correspond to entries in the annotated bibliography in Appendix B.

As long as small children are present, the dining operation is likely to be a "messy" activity, and therefore it is desirable to confine this activity to an area that is easily cleaned.

Equally important is the fact that the dining table seems to be the one meeting place for the entire family, and, as such, it should have a degree of permanence that is not generally associated with the location of the dining table in one corner of the living room.

Furthermore, it appears that much informal neighborhood contact and activity goes on around the coffee cup. In one sense of the word, much of the real family "living" takes place in this area.

Food Preparation and Cleanup

The requirements for this function have been thoroughly studied for the "average" family. The special requirements that accrue to low-income families are not known. Presumably these families will have fewer mechanical aids at their disposal, and almost certainly they will use the galley-scullery for almost all of their meals as the opportunity for "eating out" will be less frequent than with higher-income families.

Laundry

In the low-income housing, laundry activities are often assigned to the kitchen. Frequently the only facility provided for laundry work is a combination sink. Sometimes a space for an automatic washer is specified.

GENERAL COMMENTS

Eating

Consideration of the demand for an eating space in the kitchen leads to the conclusion that either the kitchen-dining room or the kitchen-family room is the arrangement most suited to the normal living habits of the low-income family. In some instances it appears that it would be acceptable to have the dining area open to the living room, but, for most families, the kitchen should be closed off from the living room. Very definitely the eating space should not be a table set in a corner of the living room. The eating space must be clearly defined and "permanent" in the sense that table and chairs can remain in place at all times.

With respect to functional planning, the kitchen proper (food preparation and cleanup) has probably received more attention than any other space in the house. Studies have included the examination of the best placement of the fundamental appliances of the kitchen, the necessary amount of work surface (counter space), the required storage facilities, along with the appropriate clearances for working at the various centers of the kitchen.

Most studies (certainly those at the SHC-BRC) have concentrated on developing maximum convenience and efficiency rather than maximum economy. This approach is illustrated by the SHC-BRC recommendation to "give no credit" for storage space under or over the sink, over the refrigerator, or over the range, along with recommendations for larger counter space etc.

Requirements for Kitchen Appliances

For housing designed for the anonymous householder, there is always disagreement as to what space provisions should be made for appliances. Ideally, of course, the appliances should be sized on the basis of need and the space allotted accordingly. Some authorities, however, maintain that the housing unit should be designed to accommodate the occupant's furniture regardless of size. Adherence to such a policy can result in oversized spaces and unwarranted extra building costs.

If the appliances are to be furnished as part of the housing package, the problem is solved by the landlord's selection.

For the recommendations that are outlined later in the text, the sizes of appliances have been selected on the basis of need and varied in accordance with the size of the family.

Kitchen Counter Requirements

The counter requirements of 11 square feet specified for single-family housing in the Minimum Property Standards for One and Two Living Units (10) of FHA are less rigorous than those suggested by SHC-BRC in the Kitchen Planning Guide (37). Furthermore, the SHC-BRC requirements are closely related to the layout of kitchen, that is, certain amounts of counter are required with respect to range, sink, refrigerator, and the mixing center.

The SHC-BRC requirement varies from 13 square feet (for a layout with counters and appliances placed continuously without a break) to a minimum of 15 square feet when the kitchen is broken into two sections. Also, the SHC-BRC counter requirements are stated in terms of counter frontage, and therefore counter space in the corner of a cabinet assembly cannot be credited. This is based on the idea that the counter space must have frontage in order to be usable.

Both FHA and SHC-BRC requirements are specified for low-middle level and higher income families, and are primarily related to three-person-and-larger families.

The fact that the dining table will be available as an auxiliary work surface permits the reduction of the requirements for counter surface.

Kitchen Storage Space

The earliest Small Homes Council kitchen studies were studies of cabinet space. Using a representative list of articles (food, utensils, etc.) stored in a kitchen the amount of conventional kitchen cabinet space required for these items was determined. Conventional wall cabinets were considered to have three shelves 12 inches deep; base cabinets were to have two shelves and one drawer 24 inches deep.

The applicability of this study to low-income housing can be questioned on two counts.

First, a representative list of items stored in a kitchen today would probably differ in several respects from the list used in the study.

At the time the list was prepared, the number of available electric appliances was much less than it is today; however, this would not appear to be a problem for this study as the number of such appliances that a low-income family would possess would be small, and therefore the minimal list that was considered a part of the original study would be sufficient.

Also, the type and packaging of foods available on today's market have expanded considerably. There are many more prepackaged and semi-prepared foods available; frozen foods are now on the market to an extensive degree. One

might anticipate a greater need for storage space for frozen food; however, the comparative expensiveness of these items will probably reduce the number of purchases by the low-income group. Therefore, it can be assumed that the freezer compartment of a standard refrigerator will suffice for the amount of frozen food stored by the low-income family.

Secondly, the original list can be questioned because it was not developed particularly with low-income families in mind. How the purchases of this group differ from the middle-income groups is not clear, nor is it clear the degree of influence this factor might have on storage requirements.

Larger families will undoubtedly require more storage in the kitchen area. Obviously, more dinnerware is required; perhaps some additional storage provisions should be made for food purchased in large quantities (to save money) although it is questionable whether or not the income of these families will be sufficient to permit them to buy food ahead to any extensive degree.

The influence of home-preserved food is also unknown. This practice appear to be diminishing in rural areas; it is probably not too prevalent in urban families

In the final analysis, the knowledge of the food, equipment, and utensils to be stored is so limited that only an arbitrary decision can be made.

QUALITY OF SPACE

Where economy both of dollars and of space is a factor, some consideration should be given to the matter of the quality of the space.

The "window over the kitchen sink" may have to disappear. It is likely that where the choice lies between windows for the dining area or windows in the kitchen, the dining area will be selected, particularly as this area will serve as a multi-purpose space.

Sacrifices in quality may also be made by omitting doors from the kitchen wall cabinets; however, the cabinets should be designed so that doors may be applied in the future. It is understood that the omission of doors on kitchen cabinets is a point of complaint, but this feature may be less objectional if the kitchen is completely closed away from the living room.

SAFETY

Certain standards stem from safety requirements. For example, elimination of cabinets over the range (fire hazard) requiring space alongside the range for positioning handles of pots (prevention of burns) and location of the range away from an internal corner of the kitchen (prevention of burns). These stipulations result in the need for more space and, accordingly, may have to be eliminated because of economic considerations.

RECOMMENDATIONS

Eating

As previously discussed, it is recommended that, except for 1 and 2 persons "efficiency" units, space for daily eating be provided as a part of the kitchen. This may be in the kitchen proper or as an alcove off of the kitchen.

The eating space should be provided in relation to size of family.

Table

Provide the following minimum eating table sizes: (Sizes are based on individual spaces with a frontage of 24 inches and an area of approximately 240 square inches. Tables must also be large enough to accommodate serving dishes, etc.

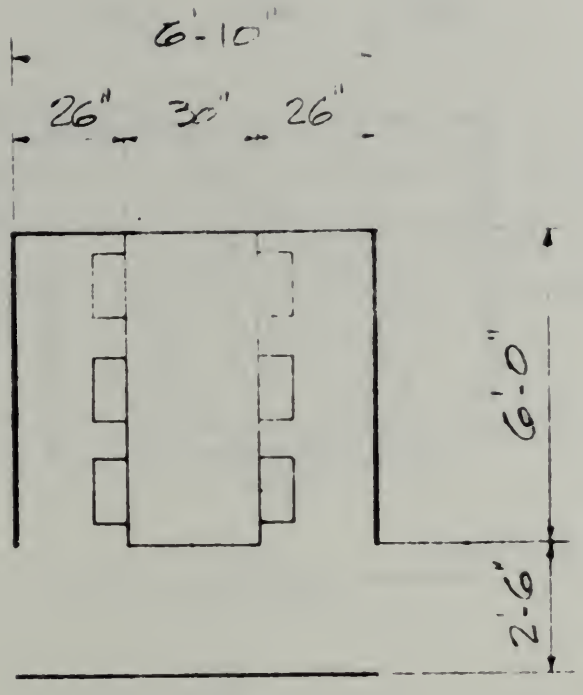
	Seating on 2 sides (dimensions in inches)	Seating on 4 sides	
For 2 persons	30 x 30		
3 - 4 persons	30 x 48	30 x 38	
5 - 6 persons	30 x 72	40 x 48	48" round
7 - 8 persons	30 x 96	40 x 72	

Clearances:

For chairs plus access thereto:	26 inches
For chairs plus access and passage:	30 inches
From table to wall for passage:	30 inches
From table to base cabinet or appliances:	48 inches (36" for kitchen in 2 pers households)

The tables designated for seating on two sides are generally larger than those specified for seating on four sides; however, seating on two sides almost invariably requires less room space, as can be seen in the attached illustrations.

The 26-inch clearance specified for "chairs plus access thereto" provides the space necessary to edge into the seating after the chairs have been moved back from the table. This is not sufficient clearance for an individual to pass behind the chair once it is occupied.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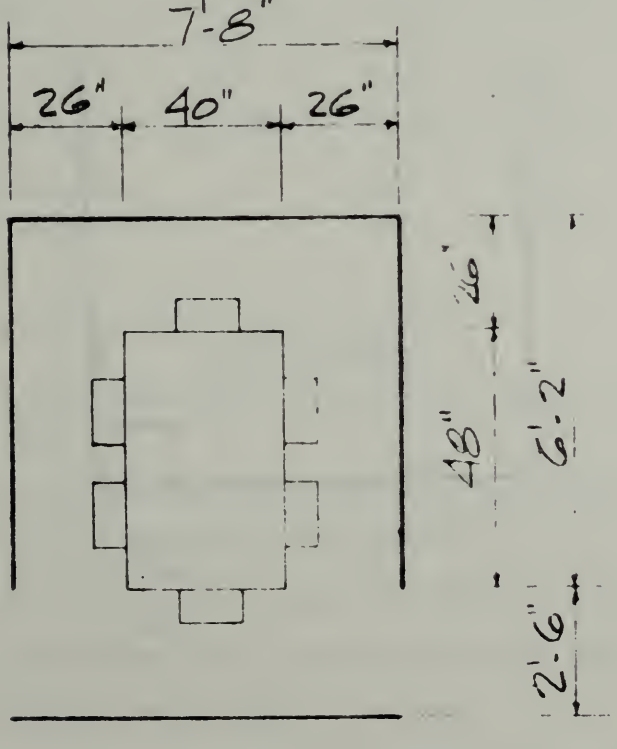
30"
26"
6'-0"
2'-6"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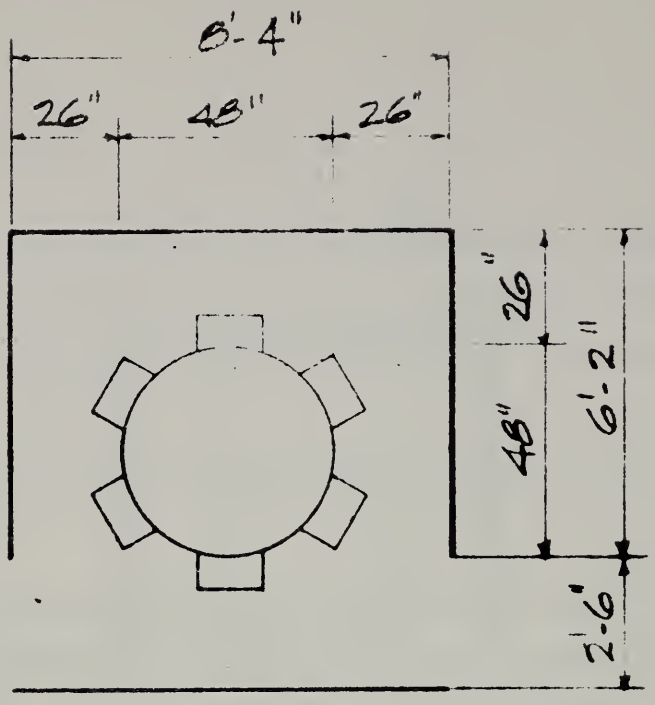
48"
5'-2"
2'-6"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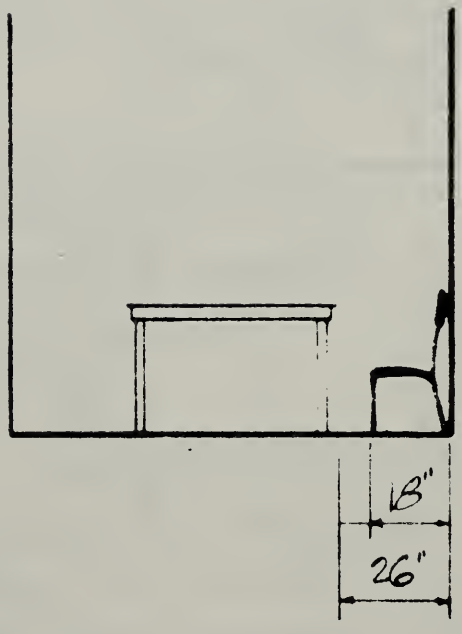
2'-6"


18"
26"

Food Preparation and Clean Up

The recommendations for space allotments for the various elements of the kitchen proper are listed on the table following.

Some of the elements are specified in terms of frontage requirements; others are indicated by an area requirement.

RECOMMENDED KITCHEN SPACE STANDARDS*
(LOW-INCOME HOUSING)

Minimums	Number of Persons				
	1 - 2(6)	3 - 4	5 - 6	7 - 8	12
Sink frontage	24"	24"	24"	24"	24"
Range frontage	21"	24"	24"	30"	30"
Refrigerator frontage	24"	30"	36"	36"	36"
Wall cabinet area (1)	15 sf.	15 sf.	18 sf.	21 sf.	25 sf.
Base and Drawer					
Combined area	19 sf.	29 sf.	35 sf.	41 sf.	41 sf.
Drawer area	5 sf.	9 sf.	9 sf.	11 sf.	11 sf.
Base cabinet area (2)	10 sf.	16 sf.	20 sf.	24 sf.	24 sf.
Counter					
Frontage	30"	42"	54"	66"	66"
Area (3)	5 sf.	9 sf.	11 sf.	13 sf.	13 sf.
Laundry tray frontage (4)		24"	24"	24"	24"
Clothes washer frontage (4) (5)		30"	30"	30"	30"

* Eating space requirements listed elsewhere.

(1) Only two shelves permissible over sink and range. Omit shelves over range if possible.

(2) Counter only 4 square feet under sink; none under laundry tray. Counter only 4 square feet in corner of base cabinet.

(3) If laundry tray has a cover, it may be counted for counter.

(4) Laundry tray and washer may not be required or may be located elsewhere.

(5) Do not count clothes washer top as frontage.

(6) These kitchen requirements can be reduced for housing intended for the aging where central dining facilities are provided.

COMMENTS ON RECOMMENDATIONS

Counter Space (Work Surface)

Counter space is reduced from the requirement stated in the FHA MPS for One and Two Living Units (10) and is also considerably reduced from the recommendations published in the SHC-BRC Kitchen Planning Guide (37). This reduction is justified on the basis that there is to be a dining table in the kitchen which can be used for a work surface. It is greater than the requirements specified in the Low Rent Housing Manual (17).

Wall Cabinet Space

Wall cabinet space for the smaller units is less than required by FHA MPS; however, the amount suggested is approximately equal to that specified in the original SHC-BRC study Cabinet Space for the Kitchen (27).

Drawer Space

The requirements are reduced. The final recommendation in effect requires a drawer in each base cabinet.

Base Cabinet

FHA MPS for One and Two Living Units (10) require a minimum of 20 square feet of base cabinet per dwelling unit. This has been reduced for 1 - 4 person units, but equaled or exceeded for larger units. The recommendation is below the SHC-BRC guidelines.

Combined Storage

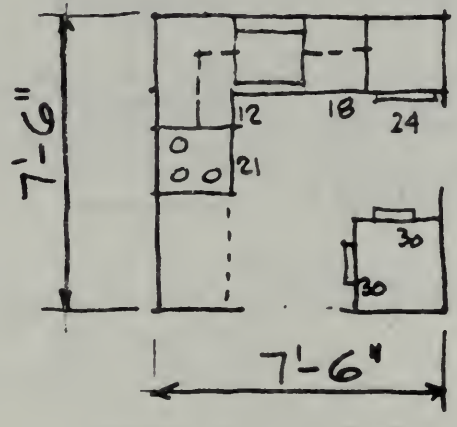
The total of the combination of recommended amounts of wall and base storage is less than the FHA MPS of 50 sq. ft.

There is little question but that the inhabitants of the units could use the amounts specified in the single-family MPS as the quantity of food, utensils, dinnerware, etc. to be stored are probably similar to those in middle-income families--in fact, if a quantity purchasing policy is followed the demand for space may be even greater. Nevertheless, some concessions must be made to reduce initial costs. Furthermore, a comparison with many apartments being built today for the middle-income market will indicate kitchen facilities of a poorer grade than these guidelines suggest.

KITCHEN- DINING R'MS.

2 PERSONS

(NO LAUNDRY)



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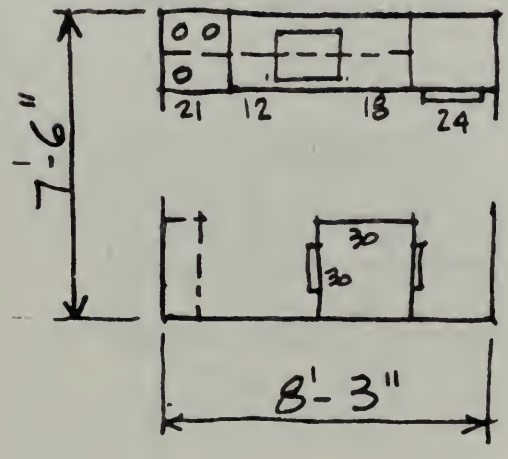

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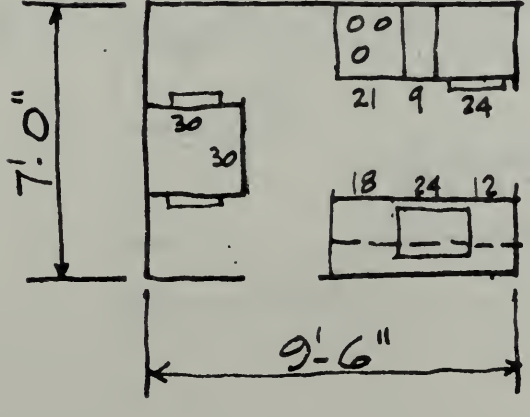

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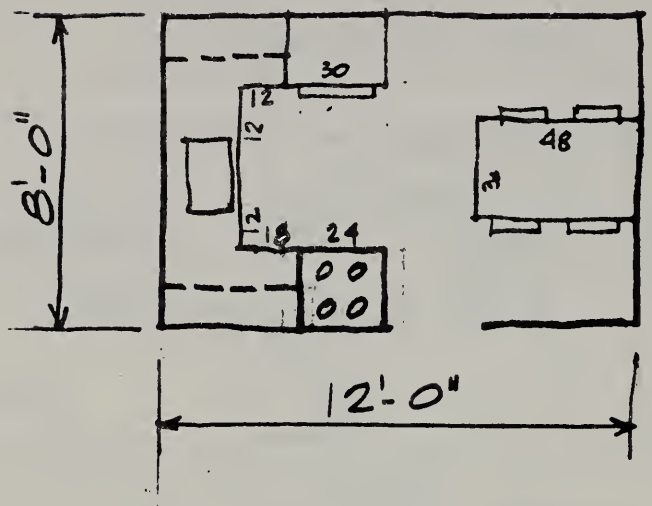
(NO LAUNDRY)



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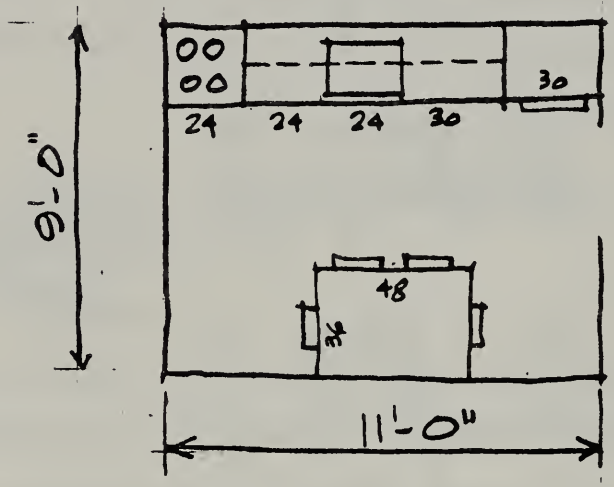

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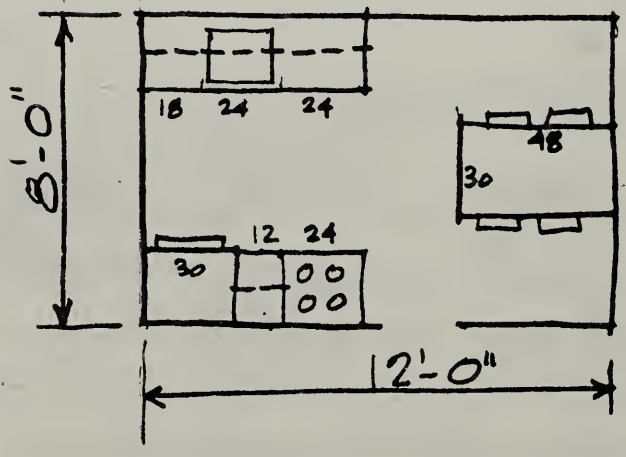

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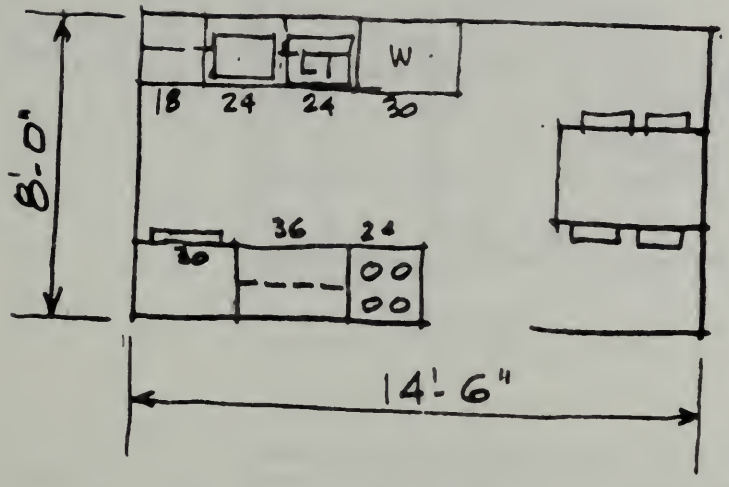
4 PERSONS
(WITH LAUNDRY)



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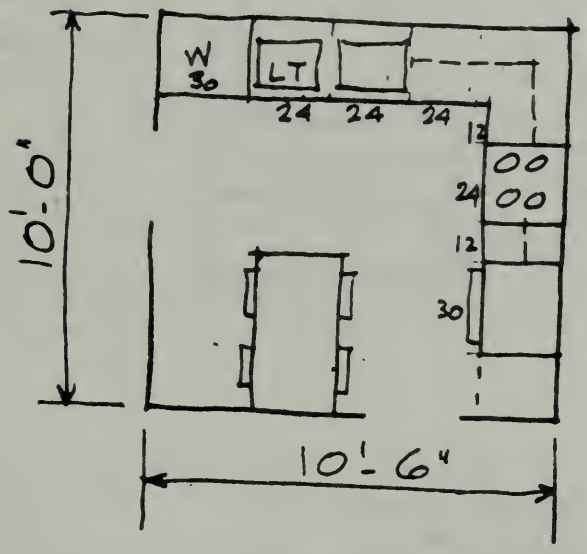

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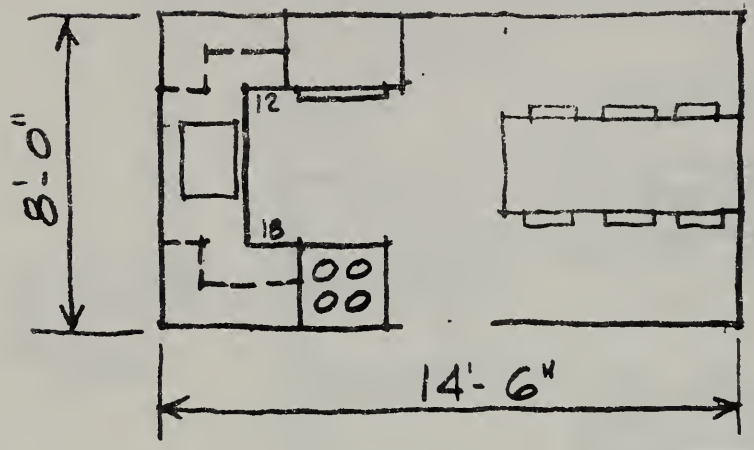

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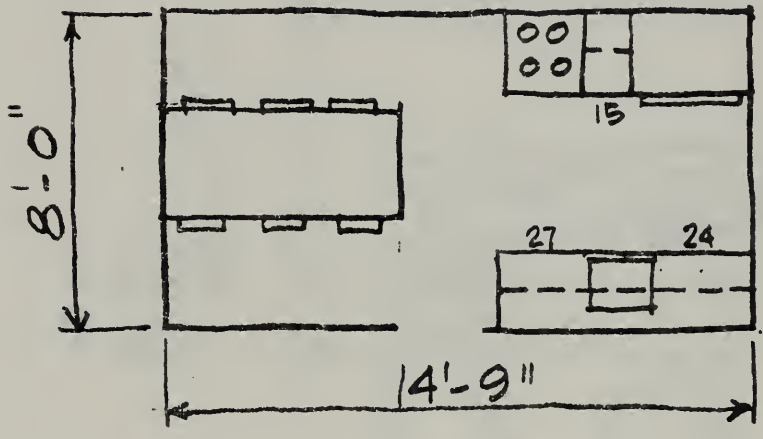

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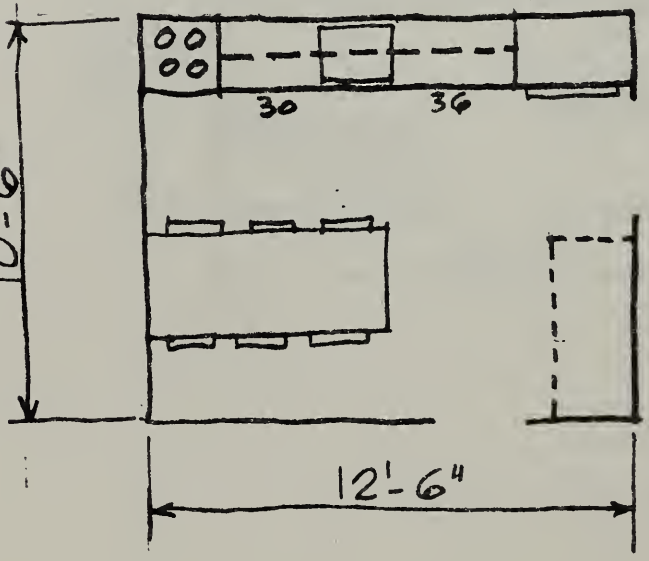

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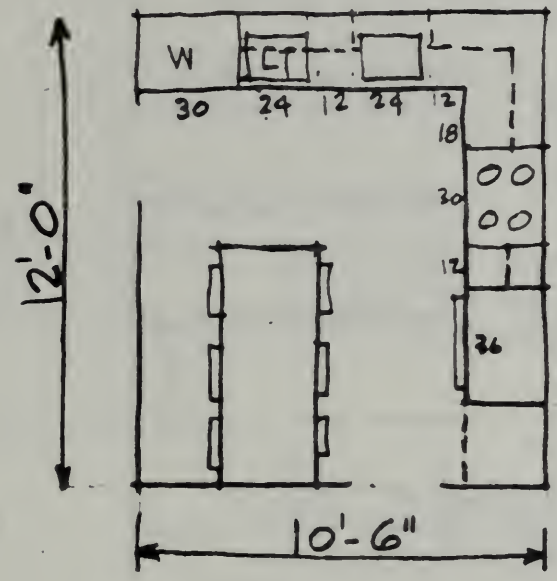
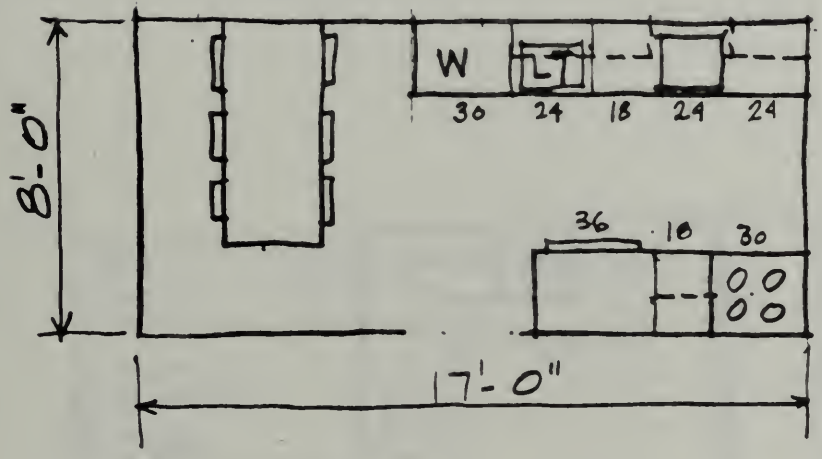
6 PERSONS
(WITH LAUNDRY)



AREA
126 ☐



AREA
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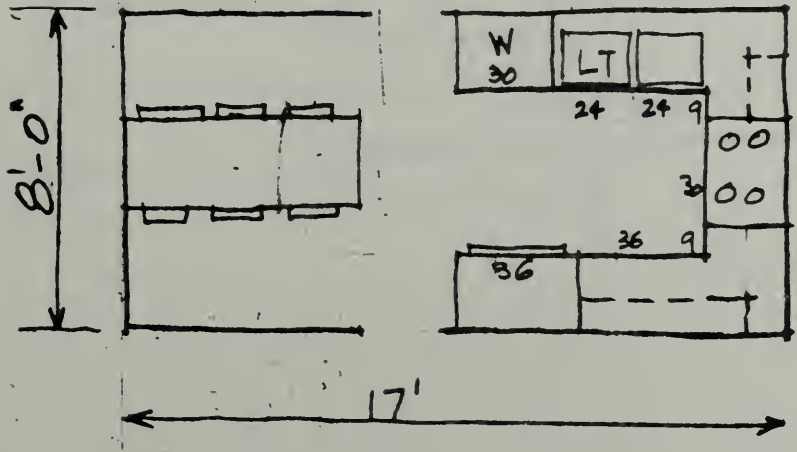
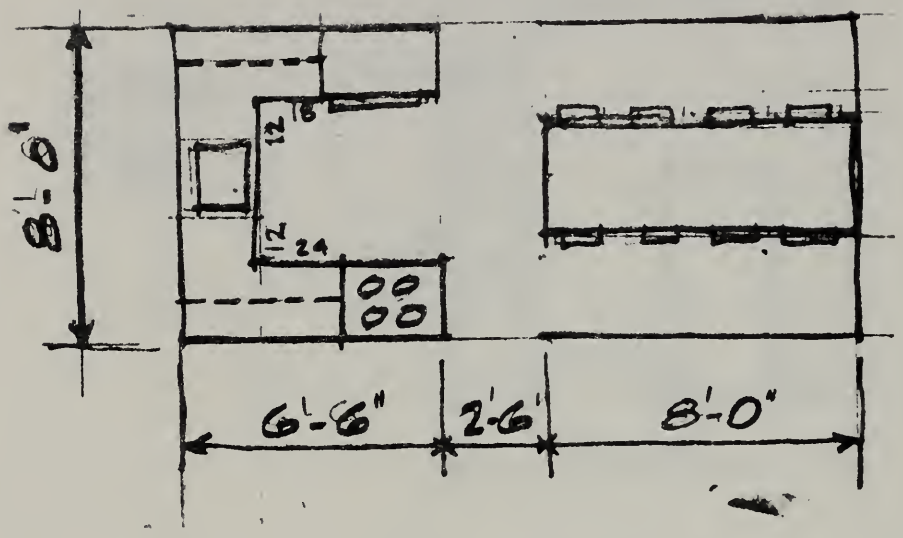
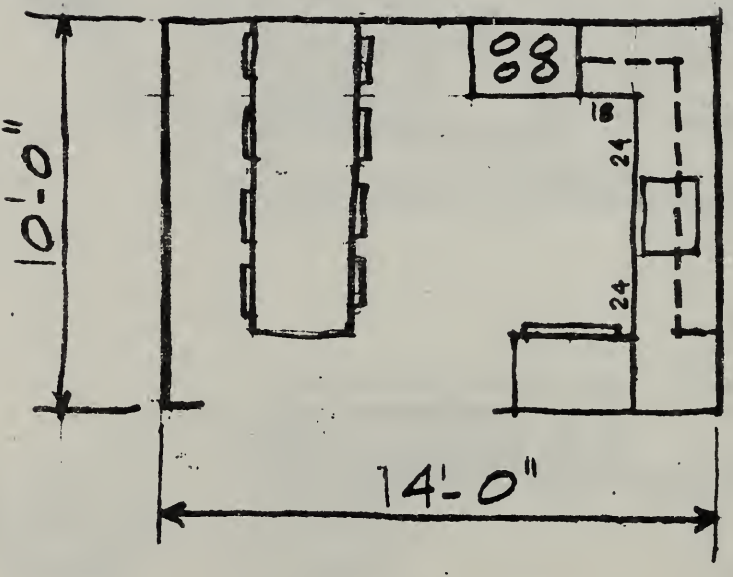


AREA
136 ☐

8 PERSONS
(NO LAUNDRY)

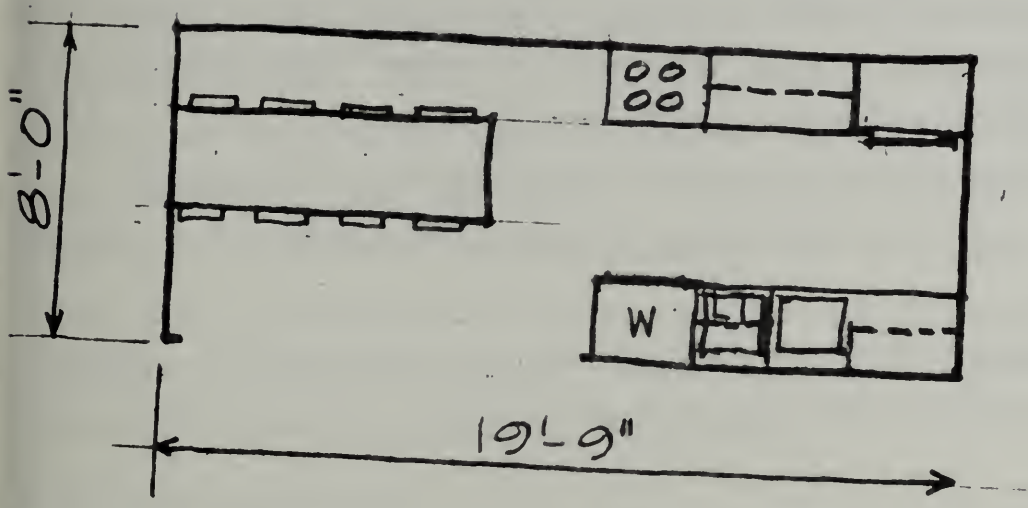


AREA
136 □'

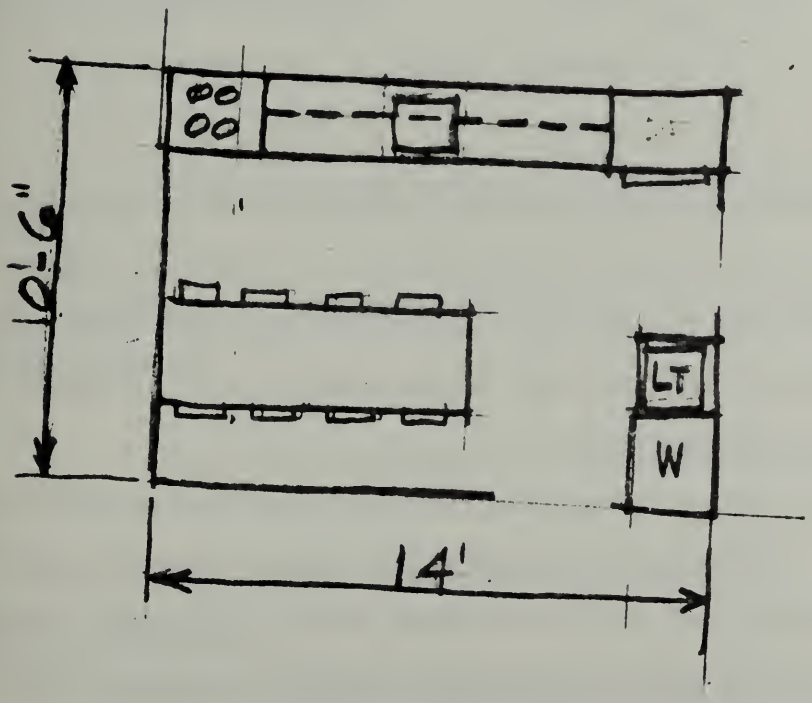


AREA
140 □'

8 PERSONS
(WITH LAUNDRY)



AREA
158 □



AREA
147 □

III. CLOTHES CARE

FUNCTIONAL REQUIREMENTS

Clothes care involves storage of soiled clothing, washing, drying, ironing or pressing, mending, and spot cleaning. Sewing also may be placed in this category.

New and different kinds of fabrics require different treatments. Some clothes must be hand washed; some must be drip-dried. Permanent press clothing must be dried in a controlled heat device, usually a dryer.

Unless a mechanical dryer is available, the drying process creates the greatest need for space. For drip-drying, the area used must be able to withstand water.

No special allotment of space is required for the ironing operation. Usually this is superimposed upon other areas such as the kitchen, the living room, or a bedroom.

Maximum convenience in the laundry operation calls for a sorting space, a laundry sink or tray, and a washing machine. For minimum housing, this is usually reduced to a laundry tray. For larger families, it is desirable to provide space for an automatic washer.

GENERAL COMMENTS

Early in the design process it must be decided whether the washing-drying operation is to take place in the individual housing unit or in a central area. Arguments can be stated for both approaches. Central facilities reduce the space requirements for the individual units, but they create management problems. The tenants usually prefer individual facilities.

A considerable amount of space is required for the drying lines needed to handle a washer-load of clothes. In detached, semi-detached, and row houses, it can be assumed that individual drying yards will be available, and will be used by the occupan Central drying yards may be available for apartment buildings occupied by low-income families, or central equipment may be available, but some other provisions may have to be made, particularly if the apartments have individual clothes-washing facilities. The bath can be a convenient location for drying small lots of clothing, and is particula suited to handling drip-drying.

Laundry

Historically, in compact housing, laundry activity and equipment has been associated with the kitchen. Too many persons find this an unsatisfactory arrangement. It is undesirable, and perhaps unhealthful, to have soiled linens and clothing in the same area where food preparation is carried on.

Careful study should be given to the desirability of associating the laundry with the bathroom. There are a number of things in favor of this approach. Most soiled linen and clothing comes from the bedroom-bathroom area. The bathroom is a space designed for high humidity. Plumbing is available. Laundry activities can continue while meal preparation is under way. A considerable amount of hand laundry is now done in the bathroom. The bathtub provides a convenient drying area for drip-dry clothing. About the only detriment to the location is the possible difficulty of carrying clothes out to dry.

RECOMMENDATIONS

For housing designed for three or more occupants, where central facilities are not available, provide:

1 laundry tray (frontage allowance 24")

or

1 combination sink and tray with tray cover (frontage allowance 48")

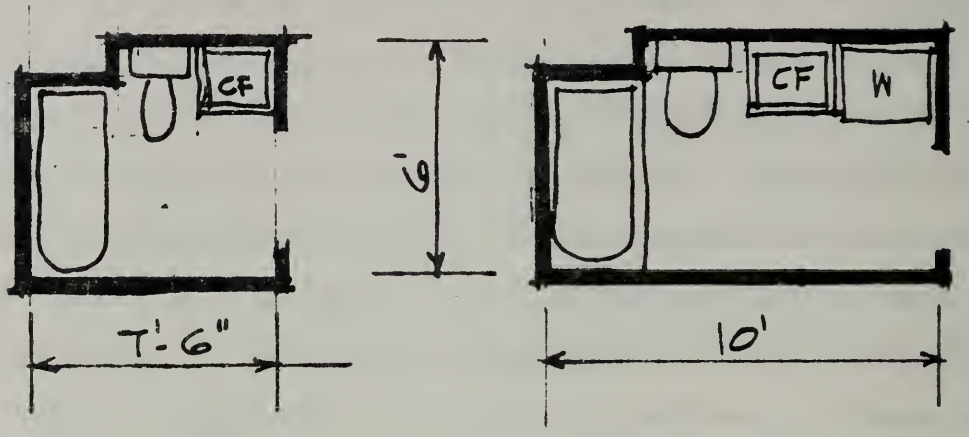
In addition, consideration should be given to providing space for an automatic clothes washer.

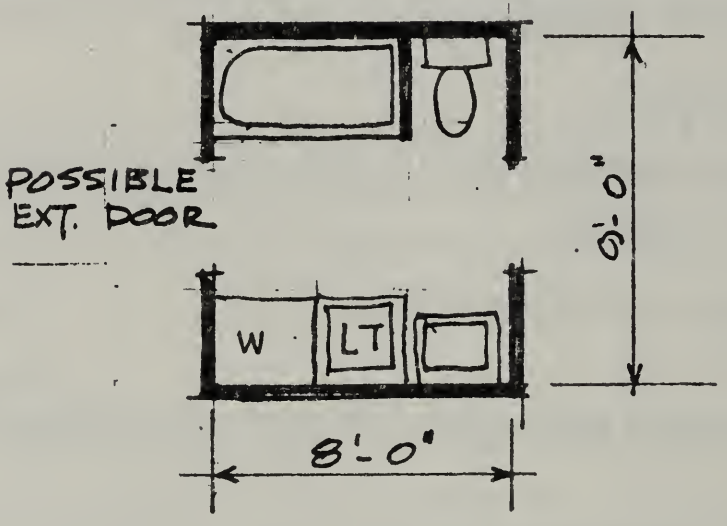
1 space and connections for clothes washer (frontage allowance 30")

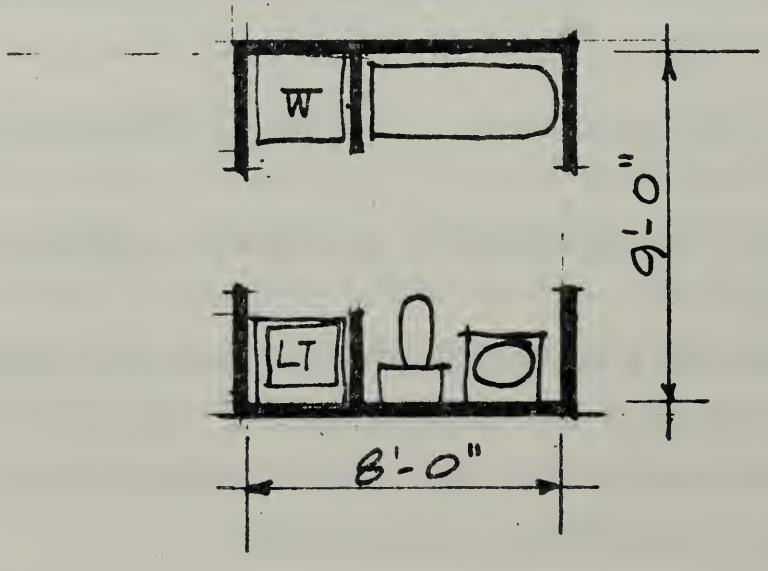
It is strongly recommended that the bathroom be considered as the location for this equipment.

It is suggested that a combination lavatory-laundry tray might be developed which would be very useful for low-income housing. Basically, the unit would be a laundry tray, but it would be equipped with a removable lavatory basin insert which would be used except during laundry periods.

CF = COMBINATION FIXTURE =
COMBINED LAVTY - LAUNDRY TRAY







IV. LIVING ROOM

FUNCTIONAL REQUIREMENTS

In one sense, the living room serves as a "catch-all" location for many of the recreational and self-improvement activities of the household, as well as other miscellaneous activities. Presumably this is the room where guests are entertained, the family reads, watches television, indulges in certain hobbies, etc. Occasional work activities may also take place in the living room. For example, sewing may be done in the living room, particularly if there is not sufficient space elsewhere in the house. Sometimes the living room serves as the sick room; it is often the focal point of child-play if there is not sufficient room in the kitchen. With this wide variety of activities, it is impossible to develop a completely rational approach to the space requirements of the room. Accordingly, the most effective method is to stipulate certain minimum dimensions and minimum areas for this space, these being based on previous standards and on past experience. (It should be noted, however, that the requirement that the eating space be included in the kitchen--which is a part of these recommendations--relieves part of the burden on the living room. Some occasional buffet suppers may take place in the living room, but this will be infrequent.)

One suggestion that has merit, but is difficult to evaluate, is that the living room should also be used as the master bedroom. Where space is a premium, this is indeed a good possibility. There are many families of moderate income that live in efficiency apartments where the sleeping is done in the living room. However, these are usually two-person families. The difficulty of making this kind of arrangement for a larger family arises from the fact that the privacy of those sleeping in the living room is considerably reduced. It is recommended that the use of the living room as a bedroom be avoided if at all possible. Nevertheless, in certain cases, this arrangement should be carefully evaluated as a means of reducing the initial cost of constructing the dwelling unit.

RECOMMENDATIONS

Provide living space as follows:

	Living-Dining	Living
Elderly		
1 - 2 persons (no bedroom)	185*	
1 - 2 persons (1 bedroom)	120	120
Non-elderly		
1 - 2 persons	**	145
3 - 4 persons	**	155
5 - 6 persons	**	160
7 - 8 persons	**	165

* Includes 65 sf. allowance for bed space, dresser, etc.

** Dining-kitchen combination recommended

Minimum room dimension: 10'-6"

V. BEDROOMS

FUNCTIONAL REQUIREMENTS

Bedroom space is used primarily for sleeping and dressing. There shall also be room for housekeeping (especially critical in cleaning under the bed) and necessary storage facilities.

A study of public housing showed that bedrooms are used for other activities as follows:

Children's recreation - 46% of the families with children
Children's study - 30% of the families with school-age children
Sewing - 25%
Ironing - 5%

Statistics indicate that, on an average, a family of four would have illness in the household 28 days a year. Hence, an important factor in bedroom planning is provision for this contingency.

Sleeping space for infants under two years of age requires a crib in the parents' bedroom. Additional space for drawers or shelves for the baby's clothing and bedding is necessary.

GENERAL COMMENT

A larger proportion of the bedroom floor area is occupied by furniture than is the case with any other room; windows and doors account for a large percentage of the wall and partition space. These two factors complicate the planning of bedrooms, especially when the rooms are small.

Because of the room layout, some bedrooms with smaller areas better meet the needs than larger ones. The location of doors, windows, and closets must be properly planned to allow the best placement of the bed and other furniture. Tidiness is difficult at best and is not promoted by planning that forces a cluttered arrangement.

Privacy, both visual and sound, are desirable for the bedroom. Children's bedrooms should be located away from the living room, because conversation in the living room prevents the children from sleeping. Closets should be used between all bedrooms wherever possible.

Double beds were used in the majority of the rooms in a survey of public housing projects and the remainder of the bedrooms were finished with one or two single beds. Half of the families expressed a preference for all single beds or part double beds and part single beds. (29) Those families preferring both single and double beds wanted the single beds for children. The preference for double beds was usually because of the additional cost required for two beds and necessary bedding.

Each child needs a space that is its own to develop a sense of responsibility and a respect for the property rights of others. The ideal course would be a bedroom for each child, but since this is rarely possible, there should be a bed for each.

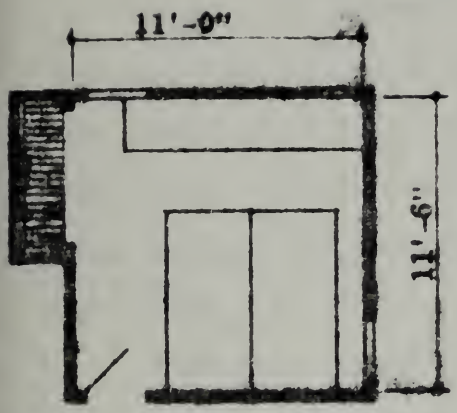
In analysis of bedroom placement in the plan, it is important to know the ages of the children in the family. With pre-school-age children, it is best if the parent's bedroom is close to the children's. With teen-age children, separation of the parent's bedroom from the other bedrooms is advantageous.

QUALITY OF SPACE

The minimum room width shall be determined by the space required for the bed, activity space and any furniture facing the bed. Widths less than 9'-0" will usually require extra area to accommodate comparable furniture. See Figure on next page.

The wall location for the head of the bed should be away from the windows, except in Southern areas where bed space should be preferably near windows. The space for the crib should be planned in the master bedroom away from traffic.

TWIN BEDS



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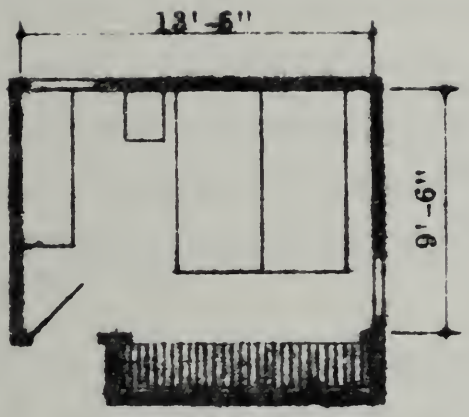

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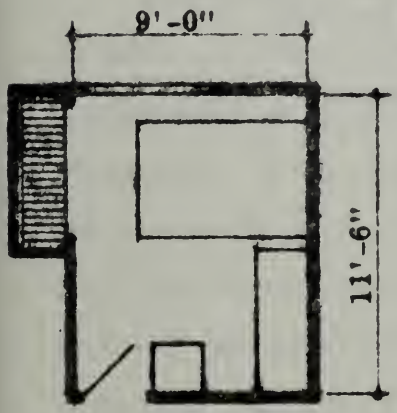
DOUBLE BEDS



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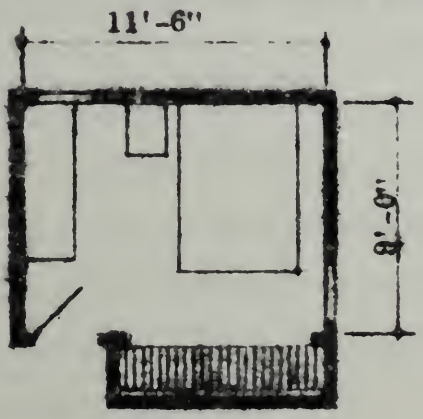

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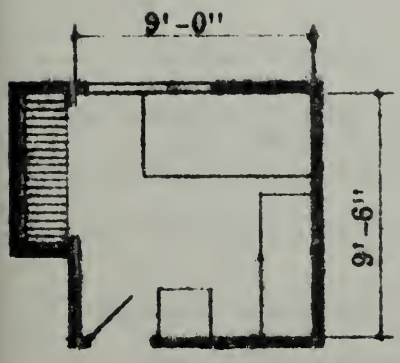
BUNK BEDS



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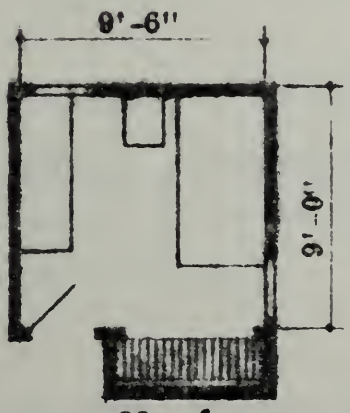

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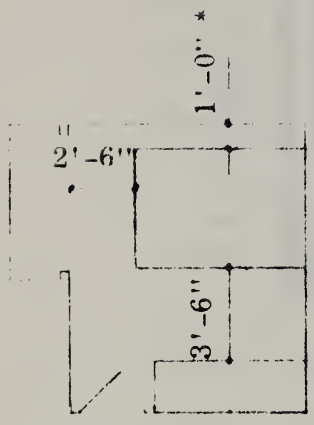
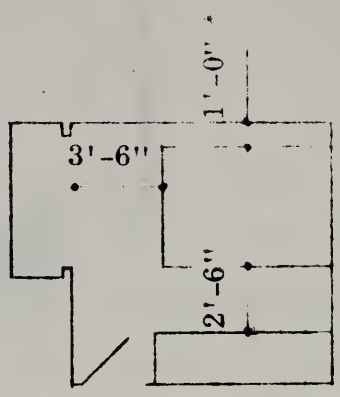
The most efficient arrangement of bedroom furniture depends on the location of the doors and windows. The above plans illustrate two arrangements of these elements for efficient bedrooms for two people with twin, double and bunk beds, as well as 7'-6" of wall furniture. A bedroom for one person and a single bed is little smaller than for two with a bunk bed. Hence, a one person bedroom is not recommended.

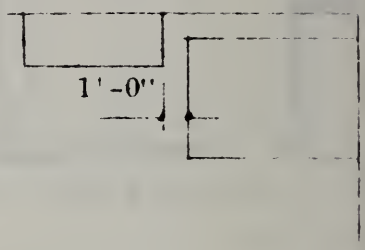
ACTIVITY SPACE CRITERIA FOR BEDROOMS



Wide Space at Side

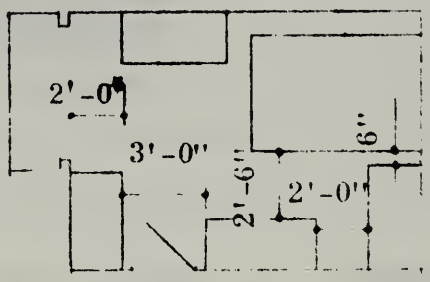


Wide Space at Foot



* If Single or Bunk Beds, No Clearance Required Between Bed and Wall

MINIMUM CLEARANCE ADJACENT TO BED



MINIMUM CLEARANCE AT FRONT OR SIDE OF WALL FURNITURE

Clever and maximum utilization of odd spaces may produce the required bedroom storage without excessive-sized closets. Placement of the closet in the corner, so it is next to the door into the bedroom, minimizes the use of wall space. The door swinging against the closet opening is an acceptable inconvenience that is more than offset in small bedrooms by the greater usable wall space.

Absence of closet doors is a sensible economy. Opposed to this are the dust problem, expense of curtains to tenants, and a closet door offers concealment. If possible, tenants would prefer doors, at least in the bedroom closets.

Accessible rod length is the true measure of the capacity of clothes closets. As long as the closets are limited to a width of 2'-0" or 3'-0", accessibility is no problem, but when the width is doubled, accessibility is paramount. If the closet is 2'-0" deep, only 6" of the rod that is concealed by the door jamb on each side of the door should be considered accessible. If there is a 6" clearance in front of the clothes (2'-6" minimum closet depth) up to 12" of rod concealed by the jamb is accessible. Walk-in closets shall have 1' -6" in front of the clothes, the full rod length is accessible. Walk-in closets shall have 1'-8" clearances between the two racks of clothes.

RECOMMENDATIONS

Furniture

A good working knowledge of the kind, number, and size of furnishings the tenants are likely to have is of first importance. The following recommended furniture is established to serve as a guide in planning for use unless more specific knowledge is available for the tenants to be served.

- Parents' Bedroom

Parents' bedrooms must be larger than others, because their possessions are larger, and the rooms sometimes accommodate the baby. Following is the recommended furniture:

Bed:

1 - double bed (4'-6" x 6'-6")
or 2 single beds (3'-3" x 6'-6" each)

1 - crib (2'-4" x 4'-5")

Storage furniture:

1 - dresser (3'-6" x 1'-10")

1 - chest of drawers (2'-6" x 1'-10")

1 - chest or trunk (2'-6" x 1'-10") *

Chairs:

1 or 2 ** (1'-6" x 1"-6" each)

Bedside table **

Table:

For sewing machine or other work ** (1'-6" x 2'-0")

Bedroom for Two Children

Beds:

2 - single beds (each 3'-3" x 6'-6")

or 1 double bed (4'-6" x 6'-6")

Storage Furniture:

1 - dresser (3'-6" x 1'-10")

1 - chest or desk (1'-6" x 2'-6") * for children's toys and for play

Chairs:

1 or 2 ** (1'-6" x 1'-6" each)

Closet Needs

Each bedroom shall have at least one closet, primarily for clothes hanging.

The accessible rod length for the master bedroom closet shall be 6'-0" may be in two closets): accessible rod length in each other bedroom shall be 3'-0".

The depth shall be 2'-0" clear for the required rod length.

The height required to permit 5'-0" clear hanging space for the required length.

* Desirable, unless the need is satisfied by adequate closets or general storage

** Desirable. These expensive needs may not occur with all low-income families

One shelf, with at least 8" clear space over the shelf shall equal the rod length.

At least half of the closet floor space depth shall be flat.

Additional built-in drawers or shelves of an average height of 10" and front-to-back depth of at least 18" can replace the required space for dressers or chest of drawers, provided there is 3'-0" of drawer or shelf frontage for each foot of required frontage for dressers or chests of drawers.

Activity Space

Proper activity space shall be provided to allow access to all doors, closets, furniture front and bedside as follows:

One side of bed or foot - 3'-6" minimum.

Alternate clearance for foot or one-side of bed - 2'-6" minimum.

Least used side of a double or pair of twin beds - 1'-0". Least used side of single bed can be used against a wall.

Side of bed to side of dresser or chest - 6".

In front of dresser, chest of drawers or closet - 2'-6" minimum, except front of dresser to side of dresser or chest of drawers - 2'-0" minimum.

Path from door to closet or front of furniture or bed to be 2'-6" wide.

VI. STORAGE

The planner should have reasonable knowledge of the items to be stored, and where they will be stored. The kinds, number and size of these items will vary with the local customs, and the best place for storage will vary with the relation of the dwelling to others, and to the ground access and basement, if any.

General Storage

In addition to the closets and storage required for bedrooms, kitchen, laundry and bath, consideration must also be given to the storage of linens and bedding, coat closet and general storage. This includes recreation equipment, vehicular toys and strollers, household tools and, where the tenant participates, for garden tools, screens, paint and hand tools.

Storage Inside Versus Outside of Dwelling

Ideally, all of these general storage possessions will be stored inside the dwelling unit, but economic considerations will necessitate use of some general storage space in the basement or other central storage location. This space will be needed, most of all, for bicycles and other vehicular toys and perambulators, as well as garden equipment, in some cases. Bars should be provided at ground level for locking vehicular toys while in use outside. Enclosed central storage should also be provided for these items and should be locked. Where practical, the individual tenants should be given the key. Experience shows that when management controls the key, the tenants will refrain from its use. In fact, only 13% reported using such locked storage in a survey of 1,000 families (29). The majority of families stated that they did not need it, they preferred to keep trunks in their dwellings, and that storage is inconvenient of access or unlocked.

Although the location of bedroom, linen, and coat closets are more or less determined by the arrangement of rooms, this is not true with respect to general storage. The nature of the dwelling type, the manner in which the unit is planned, and many other factors, even the type of fuel used, should influence this design.

The building type influences this storage as follows:

In apartments with basements, a limited amount of general storage space should be in the dwelling, and a substantial part can be in the basement, provided there is inside access from the dwelling to the basement.

In apartments **without basements**, the general storage must be in the dwelling, but this necessitates carrying perambulators and bicycles from upper floors to grade.

In row or duplex houses which have individual heating systems, most of the general storage can be within or adjacent to the heater room. The fuel will determine the need since, in the case of coal, separate spaces are needed.

Items to be Stored

The evaluation of storage requirements must consider the total needs. Limited space in storage of one type, such as a broom closet, can be offset by extra large storage space in closets of another type, such as general storage. The key to better minimum standards lies in the identification of critical types of storage which are undersized frequently.

The table which follows identifies the items to be stored in their places of storage. It is based on reported needs of public housing families. (29) and (30)

TABLE OF STORAGE ITEMS

	HOUSEHOLD ITEMS TO BE STORED	PLACES OF STORAGE		
		Most Likely Storage Location	Alternate at Lower Level	Alternate in Other Closets or Storage Furniture
Items Used Commonly in One Area	Clothing	In Bedroom Closets		
	Food, Dishes and Cooking Supplies	In Kitchen Cabinet		
	Supplies for Care of Clothes	In Laundry Cabinet		
	Sewing Machine	In Kitchen or Bedroom		
	Guests and Family Outer Garments	In Coat Closet		
	Linens for Bath and Bedroom	In Linen Closet		
	Clothes Hamper	Same		In Bedroom or Bath
Items Used in Several Areas or Outside	Cleaning Supplies	In Broom Closet		In Kitchen Cabinet
	Cleaning Equipment	Same		
	Ironing Board	Same		
	Card Table and Chairs	In General Storage Inside		

	HOUSEHOLD ITEMS TO BE STORED	PLACES OF STORAGE		
		Most Likely Storage Location	Alternate at Lower Level	Alternate in Other Closets or Storage Furniture
	Step Ladder	In General Storage in Dwelling	In Locked Storage	
	Luggage		Same	
	Thermos Bottles	Same	Same	In Kitchen or Bedroom *
	Picnic Equipment	Same	Same	In Bedroom *
	Electric Fan	Same	Same	In Kitchen or Bedroom ó
	Seasonal Ornaments	Same	Same	In Bedroom *
	Recreational Equipment			
	Tool Chests	Same	Same	In Bedroom
	Collections	Same	Same	In Living Room or Bedroom ó *
	Hobby Materials	Same	Same	In Living Room or Bedroom ó *
	Toys	Same	Same	In Bedroom ó *
	Vehicular Toys and Perambulator	At Grade Inside, and Outside with Rail for Chaining	Same	
Items used in Duplex on Ground Floor if Tenant Maintains the Lawn	Lawn Mower		In Basement or Utility Room	
	Hoe, Rake or Clippers		Same	

TABLE OF STORAGE ITEMS

	HOUSEHOLD ITEMS TO BE STORED	PLACES OF STORAGE		
		Most Likely Storage Location	Alternate at Lower Level	Alternate in Other Closets or Storage Furniture
	Hose, Spade		In Basement or Utility Room	
	Lawn Chairs, Grill			
Items used if Tenant Does Maintenance	Painting and Decorating Supplies		Same	
	Storm Windows and Doors		Same	
	Screens		Same	
Items Special to Some Areas	Root Storage	Special Cool Storage in Basement, if Available		

* Some of these items can be stored in the trunk in the bedroom

GENERAL COMMENT

Public housing storage space standards should be consistent with the goal of providing suitable storage for the lower income groups. The storage requirements should not be so high as to overprice the dwelling accommodations.

Accumulations will always expand to fill the accessible storage such as the floor and shelves within existing closets. But experience shows that people seldom organize their belongings and add shelves to achieve better use of available storage space (20).

RECOMMENDATIONS

	Items Stored	Dimensions
Broom Closet	Should normally accommodate: Cleaning equipment including: sweeper, broom, mops, brushes, pails, dust pan and vacuum cleaner	Vacuum cleaner Tank type: 23"x 7"x 10" high Upright: 12" x 13" x 48" high
	It may accommodate: Ironing board	Ironing board folded: 15" x 5" x 63" high
	If shallow shelving if built on the back of the door, it can accommodate small tools and cleaning equipment.	Minimum recommended size: 24" wide and 16" deep with shelves 63" to 72" above floor with 8" space above shelf
	A shelf can accommodate cleaning supplies including: cleaning cloths, paper supplies, and cleaning supplies in bottles, cans and packages.	

Linen Closet	Should normally accommodate: Bath linens including: towels, washcloths and bath mats Bedding including: blankets, comforters, mattress pads, pillows, pillow slips, sheets and spreads	Towels folded 11" x 14" Spreads, large size folded 12" x 14" Sheets, large size folded 12" x 13" Maximum depth of shelving for linen storage 24" Minimum height from shelf to shelf 10 inches. The net useable shelf area shall be in multiples of 12" x 14" and shall be at least 9 square feet for dwellings of 1 or 2 bedroo 12 square feet for dwelling of 3 or 4 bedrooms The top shelf for daily use shall be within 6'-0" of the floor.
Coat Storage	Should normally accommodate other garments of family and guests. Preferably to be located in one closet near an entrance, or may be provided with extra rod length in bedroom closets.	Same minimum sizes and equipment as bedroom closets Should normally accommodate 1'-0" of rod space per bedroom in dwelling, with 2' minimum rod lengt in any one section.

General Storage	General storage space within the dwelling is needed for the miscellaneous items that are not commonly used in one location of the house. They range from small items such as hobby materials to large items such as a stepladder.	Stepladder, folding, , 66" to 78" x 24" x 6" Trunk, 24" x 24" x 42"
	Accessible floor space in the general storage area shall be provided for some large miscellaneous items. This space may be located in a separate closet or it may be combined with the broom closet.	6'-8", minimum height of general storage space for large items. Minimum floor area for general storage shall be 9 square feet*
	It should be located in a position that is accessible to the kitchen or hall and screened from the living room.	Minimum depth, front to back shall be 2 feet. Minimum width shall be 3 feet 6 inches.
	Small items used intermittently can be stored on shelves in the general storage area or on extra shelf space located in other closets.	Minimum total shelf area for general storage shall be 10 sq. ft. plus 5 sq. ft. per bedroom.
	Medium-sized miscellaneous items, such as an electric fan or picnic basket, may be accommodated on floor or shelf space in a general storage unit or on extra shelf space in other closets.	Minimum front-to-back depth shall be 12" and at least 50% of the shelf area shall be 16" deep or more.

*In apartments without basements or locker storage, the floor area for general storage in the dwelling must be increased accordingly.

APPENDIX A

SUMMARY OF PREVIOUSLY PUBLISHED STANDARDS

TABLE I - PUBLISHED SPACE STANDARDS
Minimum Room Size in Square Feet Except as Noted

REFERENCE NO. **	4	7	8	10	11	12	13
Living Room	193	140		160	140	160	160
Dining Room		80		80	80	100	90
Living-Dining Comb.		160		180	180	200	200
Kitchen	65	50		60	50	60	50
Kitchenette		40				40	30
Kitchen-Dining Comb.		60		100	90	80	90
L. R./D. A./Kitchen		210		220	220	260	250
Bedroom Primary	114			120		120	120
Bedroom Secondary,			103 first occup.				
or other habitable room	97	70	63 sec. occup.	80	70	80	
Bedroom-One Person	55						
Halls or Foyer						25	
Bathroom							
Laundry	43						
Storage, Total						100 c. f.	
Closets		12' for first +					
Bedroom-Primary		6' for others		6	3' rod	10	5'long
Bedroom-Secondary				6			
Linen				2	2		100 c. f.
General Storage							
2 bedroom house				350 c. f.	150 c. f.	200 c. f.	
3 bedroom house				425 c. f.	200 c. f.	250 c. f.	
Total Dwelling			150 first occup. 100 other occup.				

* Examples of Plans

** Refers to entries in annotated bibliography, Appendix B

TABLE I - PUBLISHED SPACE STANDARDS
Minimum Room Size in Square Feet Except as Noted

REFERENCE NO.	14	23	32	33	35	36	37
Living Room	140	165*	150	190			
Dining Room	80	56	100	99			
Living-Dining Comb.	160						
Kitchen	50		50	80			58-77
Kitchenette	40						
Kitchen-Dining Comb.	60						
L. R. / D. A. / Kitchen	210	254*					
Bedroom Primary		113*	120	138		136*	
Bedroom Secondary, or other habitable room	70		80	92		113*	
Bedroom - One Person		49*				89*	
Halls or Foyer				50			
Bathroom		35*	33*	40			
Laundry							
Storage, Total				50			
Closets Bedroom-Primary Bedroom-Secondary Linen	12' for first + 6' for others						
General Storage 2 bedroom house 3 bedroom house							
Total Dwelling					160 to 1000		

TABLE II - PUBLISHED SPACE STANDARDS
By Category

Reference No. *	Area Criteria See Table 1	Minimum Room Dimension	Activity Space	Appliance Space	Kitchen Counters & Shelf	Furniture Space	Door Access & Height	Stair Dimen.	Storage Space - Depth, Shelf Area, Height
2	X		X	X		X	X	X	X
4	X		X	X	X	X		X	X
7	X	X		X	X		X		
10	X	X	X	X	X		X	X	X
11	X	X			X				X
12	X	X			X		X	X	X
13	X	X	X		X		X	X	X
14	X	X		X	X		X		X
21			X	X	X				
23	X		X		X	X	X		
24			X				X		
25			X				X		
26			X	X		X	X		
27					X				
29		X				X			
32	X	X	X	X	X	X	X	X	X
33	X	X	X		X	X		X	X
36	X		X			X			X
37	X		X	X	X				

* Reference No. refers to entries in the Annotated Bibliography. Appendix B.

TABLE III - PUBLISHED SPACE STANDARDS

Minimum Floor Space Required for Household Activities, Furniture, Equipment & Storage

In Square Feet

"Planning a Home for Occupancy"

Standards for Healthful Housing

Public Administration Service, 1950

American Public Health Association, Committee on the Hygiene of Housing

FOR BASIC ACTIVITIES	NUMBER OF PERSONS					
	1	2	3	4	5	6
Sleeping and dressing	74	148	222	296	370	444
Personal cleanliness and sanitation	35	35	35	70	70	70
Food preparation and preservation	8	76	97	97	118	118
Food service and dining	53	70	91	105	119	146
Recreation and self-improvement	125	164	221	286	357	383
Extra-familial association	17	17	34	34	51	51
Housekeeping	48	91	110	127	146	149
Care of the infant or the ill	--	124	124	124	124	124
Circulation between areas	20	20	35	35	45	45
Operation of utilities	--	20	20	20	20	20
Total Basic Dwelling Unit Area	380	765	989	1159	1420	1550
FOR OTHER ACTIVITIES						
Laundry	36	48	65	80	96	112
Household Maintenance	--	42	42	42	42	42
Circulation, two story	--	32	32	32	32	32
Total With Other Activities	416	887	1128	1313	1590	1736

TABLE IV

Minimum Room Areas in Square Feet

National Housing Agency, Federal Public Housing Authority

"The Livability Problems of 1,000 Families"

Bulletin #28, October 1, 1945

	Family Members				
	Less than 4	4 or 5	6 or 7	8 or 9	10 and over
Living Room	154 - 190	160 - 190	160 - 200	180 - 200	200

	Master Bedroom	One-Person Secondary Bedroom
Bedroom	130 - 136	90
Bedroom Closets	12 - (3' deep)	7 - (2' deep)
Bathroom	35 - 37 sq. ft.	
Linen Closet	4 - 6 sq. ft.	

	Bedrooms in Dwelling			
	1	2	3	4
Dining Area in Kitchen	40	*	*	88
Dining - Kitchen	100	*	*	180

*Areas for 2 and 3 bedrooms are between areas for 1 and 4 bedrooms, but specific sizes were not given.

TABLE V

Minimum Furniture Schedule

National Housing Agency, Federal Public Housing Authority

"The Livability Problems of 1,000 Families"

Bulletin #28, October 1, 1945

Bedroom

Types of Furniture	Master Bedroom	Two-Person Secondary B.R.	One-Person Secondary B.R.
Double Bed	1 or 2		1
Single Bed		2	
Dresser	1	1	1
Vanity	1		
Chairs	2	2	1
Trunk or Cedar Chest	1		
Bedside Table	1		
Infants Crib	1		
Children's Toys		1	1

Living Room

90% of Families	No. of Pieces
Furniture	
Sofa	1
Easy Chair	1-3
End Tables	1-3

Other

Additional Furniture for 35% or less of the Families	
Reading Table	35% of Families
Sewing Machine	9% of Families
Piano	8% of Families
Buffet	5% of Families

TABLE VI

Minimum Kitchen Shelf, Drawer and Counter Area in Square Feet

National Housing Agency, Federal Public Housing Authority
"The Livability Problems of 1,000 Families"
Bulletin #28, October 1, 1945

	Bedrooms in Dwelling			
	1	2	3	4
Base Cabinet Shelf and Drawer	18	36	36	36
Other Storage, Including Wall Cabinet	18	22	26	30
Combined Total	36	58	62	66
Counter	6-12			

TABLE VII - PUBLISHED SPACE STANDARDS

"Low-Rent Housing Manual" - 221.1, Housing Assistance Administ
Department of Housing and Urban Development, September, 1967

MAXIMUM ALLOWABLE DWELLING UNIT AREAS

	Elderly		Non-elderly					
	Effic. 0-BR	1-BR	1-BR	2-BR	3-BR	4-BR	5-BR	6-BR
Occupancy (persons)	1	2	2	2	6	8	10	12
Room Count	3	3 1/2	3 1/2	4 1/2	5 1/2	6 1/2	7 1/2	8 1/2
Maximum Area within perimeter walls Gross sq. ft.	400	525	550	720	900	1120	1320	1540

These areas do not include stairs and stair landings inside unit, general storage and circulation outside unit, public facilities (stairs, elevators, etc.), or space for heating equipment.

For heating equipment, add 15 sq. ft. for equipment operated by tenant; add 30 sq. ft. for heater room for gas equipment; add 45 sq. ft. for heater room for coal or oil equipment.

GUIDE TO MINIMUM SPACE AREAS (not mandatory)

Living Room Minimum dimension 10'-6"			145	155	160	165	170	175
Living Room - Dining Room Combination	120	120	170	185	205	220	230	240
Kitchen	40	40	50	60	75	90	100	110
Kitchen - Dining Room Combination			70	90	110	130	150	170
Guest coat closet		4	4	6	8	10	12	14
Linen closet	2	3	4	5	6	7	8	9
Kitchen work top (counter top)	4	4	4	6	8	9	9	9
Kitchen shelving	20	20	30	36	42	54	60	60
General Storage (20% should be near kitchen)	10	20	25	30	35	40	45	50
*Bed Room #1 minimum width 8'-6"	65	120	125	125	125	125	125	125
Bed Room #1 closet	6	8	10	10	10	10	10	10
*Bed Room #2				100	100	100	100	100
Bed Room #2 closet				8	8	8	8	8
*Bed Room #3					90	100	100	100
Bed Room #3 closet					8	8	8	8
Additional Bedrooms						90	90	90

All Bed Rooms 100 SF or larger shall accommodate twin beds

TABLE VIII - PUBLISHED SPACE STANDARDS

"Low-Rent Housing Manual" - 207.1
Housing and Urban Development
Housing Assistance Administration
September, 1963

Furnishability Requirements. A dwelling unit must contain space so planned as to accommodate the following furniture, facilities, and equipment and permit free circulation with due allowance for heating devices, door swings, accessibility to electric outlets, etc. Such furnishability shall be demonstrated on the dwelling plans.

(1) Living Space

Couch, 3'-0" x 6'-9"
Large Chairs, 2'-6" x 3'-0"
1 for 1 person unit -- 2 for all others
Desk, 2'-0" x 3'-4"
None required for efficiency unit
TV, 1'-4" x 2'-8"

(2) Dining Space

Table, 1 or 2 persons, 2'-6" x 2'-6"
Table, 4 persons, 2'-6" x 3'-2"
Table, 6 persons, 3'-4" x 4'-0"
Table, 8 persons, 3'-4" x 6'-0" or 4'-0" x 4'-0"
Table, 10 persons, 3'-4" x 8'-0" or 4'-0" x 6'-0"
Table, 12 persons, 4'-0" x 8'-0"
Chairs, 1'-6" x 1'-6"

(3) Sleeping Spaces (per 2 persons)

Twin beds, 3'-6" x 6'-9" or double bed, 4'-6" x 6'-9"
(Single bed for efficiency unit)
Dresser, 1'-10" x 3'-6" (one for efficiency unit)
Chair, 1'-6" x 1'-6"
Crib, 2'-4" x 4'-5" (for first bedroom of family unit)

TABLE IX - PUBLISHED SPACE STANDARDS

"Low-Rent Housing Manual" - 207.1
Housing and Urban Development
Housing Assistance Administration
September, 1963

Maximum Areas

(1) The total floor area of the unit, measured between the inner finish of enclosing exterior walls and between partitions separating units, shall not exceed the following:

Occupancy (persons)	1	2	4	6	8	10	12
Description	Efficiency	1BR	2BR	3BR	4BR	5BR	6BR
Room Count	3	3 1/2	4 1/2	5 1/2	6 1/2	7 1/2	8 1/2
Area sq. ft.	360	550	720	900	1120	1320	1540

(2) These areas do not include stairs and stair landings inside unit, general storage and circulation outside unit, public facilities (stairs, elevators, etc.) or space for heating equipment.

TABLE X - LEISURE ACTIVITIES ACCORDING TO CHARACTERISTICS

Withrow, J. L. . Trotter, B. Y.
"Space for Leisure Activities of Teen-Agers"
Journal of Home Economics
p. 361. May 1961

ACTIVITIES ACCORDING TO CHARACTERISTIC:		
QUIET OR PRIVATE	SOCIAL	ACTIVE
Study	Guests for meals	Dancing
Magazines	Guests for snacks	Photography
Books	Guests for cards	Model cars
Handwork	Guests for visiting	Painting
Radio	Quiet games	Carpentry
Model cars	Music	Games
	Television	Records
	Records	Sewing
	Magazines	
	Radio	
	Books	
	Handwork	

TABLE XI - LAUNDRY APPLIANCE SIZES

Nichols, A., Russell, T.S., Wood, A.L.
"Space Requirements for Use and Care of Laundry Appliances"
Journal of Home Economics
p. 186, March, 1961

WASHERS	HEIGHT inches	DEPTH inches	WIDTH inches
Top-opening	36	25 1/2	29 1/2
Drop-door	37 1/2	27 1/4	31 7/8
Door swing of 90° *	44 3/8	25 1/2	32 3/4
DRYERS			
Door swing of 180°	36 1/2	26 3/4	30
Drop-door	37 1/2	27 1/4	31 7/8
Door swing of 90° *	44 3/8	25 1/2	32 3/4

* Combination washer-dryer

TABLE XII - RECOMMENDED SPACE ALLOWANCES IN FRONT OF WASHERS & DRYERS

Nichols, A., Russell, T. S., Wood, A. L.
"Space Requirements for Use and Care of Laundry Appliances"
Journal of Home Economics
p. 188, March 1961

OPERATION	MEAN +1 STANDARD DEVIATION	MODULE	SUBJECTS SATISFIED
	inches	inches	per cent
Loading washer			
Equipment A	28.8	30	91.6
B	32.2	32	80.6
C	32.7	34	97.2
D	36.5	38	97.2
Transferring from washer to dryer			
Equipment A	28.1	28	88.8
B	32.1	32	80.6
C	33.2	34	88.8
Unloading dryer			
Equipment A	38.3	40	85.0
B	38.1	38	83.3
C	40.5	42	91.6
Emptying water tray			
Equipment A	35.2	36	88.8

* Equipment A -- Top-opening washer; dryer with 180° door swing
B -- Drop-door washer and dryer
C -- Drop-door washer; dryer with 90° door swing
D -- Combination washer-dryer, same as dryer C

TABLE XIII - LEISURE ACTIVITIES OF TEEN-AGERS & PARENTS

Withrow, J. L., Trotter, B. Y.
"Space for Leisure Activities of Teen-Agers"
Journal of Home Economics
p. 361, May, 1961

T = Teen-age
P = Parents

LEISURE ACTIVITIES OF TEEN-AGERS AND PARENTS				
Activity	Family Member	Description of Most Frequently Occurring Equipment	Most Common Location of Activity	Most Common Location of Storage
Studying		Desk and small items		Bedroom
	T		Bedroom	
	P		Kitchen	
Television		TV cabinet		Living area
	T		Living area	
	P		Living area	
Magazines		25 magazines or less		Living area
	T		Living area	
	P		Living area	
Books		97 to 270 books		Living area
	T		Bedroom	
	P		Living area	
Radio		More than one radio		Living area
	T		Bedroom	
	P		Living area	
Records		Player plus fewer than 50 records		Living area
	T		Living area	
	P		Living area	
Athletics		Combination of balls and equip.		Basement
	T		Outdoors	
	P		Outdoors	
Quiet games		10 or more boxes, boards, and small items		Bedroom
	T		Living area	
	P		Living area	
Music		Piano plus music		Living area
	T		Dining area	
	P		Living area	
Sewing		Machine		Bedroom
	T		Bedroom	
	P		Bedroom	
Photography		More than one camera plus flash		Bedroom
	T		L.A. - Basement	
	P		Bedroom	
Models		6 to 12 models and small equipment		Bedroom
	T		Bedroom	
	P		---	---
Handwork		Small items plus yarn and scraps	---	Bedroom
	T		Living area	
	P		Living area	

TABLE XIV - LEISURE ACTIVITIES OF FAMILY MEMBERS WITH FEWER THAN FIVE GUESTS

Withrow, J. L., Trotter, B. Y.
"Space for Leisure Activities of Teen-Agers"
Journal of Home Economics
p. 362, May, 1961

LEISURE ACTIVITIES OF FAMILY MEMBERS WITH FEWER THAN FIVE GUESTS *				
Activity	Family Members	Description of Most Frequently Occuring Equipment	Most Common Location of Activity	Most Common Location of Storage
Visiting				
	Teen		Living area	
	Parent		Living area	
Snacks		Trays		Kitchen
	T		Kitchen	
	P		Living area	
Meals		Special tableware		Kitchen
	T		Kitchen	
	P		Kitchen	
Cards		Cards plus table, folding chairs		Living area
	T		Living area	
	P		Living area	
Dancing		Record player plus fewer than 200 records		Living area
	T		Living area	
	P		—	

*30 family units

T = Teen-agers
P = Parents

APPENDIX B

ANNOTATED BIBLIOGRAPHY

American Public Health Association-Committee on the Hygiene of Housing

"An Appraisal Method for Measuring the Quality of Housing"
New York, 1946

These instructions provide a technique for quantitative evaluation of the extent to which an individual dwelling is substandard, and for mapping out of the characteristics of a given housing area, in such a form as to be valuable to the planner, as well as for the authorities charged with the enforcement of the housing regulation. The instructions explain the nature and use of the field schedules, and they supply definitions of terms used. These definitions describe various aspects of housing. For instance, the term "dwelling unit" includes any group of rooms which have its own entrance and separate cooking facilities.

There are three schedules for field work, and only the first two are needed for the usual type of family dwelling: (1) structure schedule; (2) dwelling-unit schedule; and (3) room unit schedule.

The dwelling-unit schedule identifies the facilities, the room count, the deterioration, infestation, and sanitary indexes.

Criteria are given for classification of substandard facilities, such as a shared kitchen or bath, but no standards are given for minimum space criteria.

2 American Public Health Association-Committee on the Hygiene of Housing

"Planning a Home for Occupancy"
Standards for Healthful Housing
Public Administration Service, 1950

This is one of three volumes published by this committee, and considers those problems involved in the general planning of the dwelling itself.

It recognizes that mental and emotional health is quite as important as physical health. The frustration that results from over-crowding, conflicts between the desires and needs of various family members, fatigue due to the various household duties under unfavorable conditions -- these are health menaces just as serious, if less obvious, as poorly heated rooms or stairs without railings. The sense of inferiority, due to living in a substandard house, is a far more serious menace to the health of our children than all the unsanitary plumbing in the United States.

It is not enough to know that the average family is made up of 3.6 persons. Two-bedroom units, which were dominant at that time, are adequate for families of three or four persons, which made up 45% of the total. 35% of the "families" consisted of one or two persons, and 20% had four or more persons.

No attempt is made to establish standards for particular rooms (at least above certain absolute minimum linear dimensions). Instead, total area criteria are set for 10 specific activities of family living, according to the number of occupants. This allows freedom of designing the separate spaces.

These were arrived at by analysis of specific functions, such as dressing, preparing food, etc. For each were determined; (1) the horizontal dimension of each piece of furniture, (2) the space for circulation and use of furniture, (3) space for storage. By allowing for multiple use of activity space, the total areas for fundamental functions of the family were established. The criteria are based on actual physical measurements.

The breakdown and total area is given for families ranging from one to six persons (See Table III, Appendix A, of this report). It is recognized that these spaces are larger than those provided in speculative private housing of the day, as well as in public housing.

The total space must be divided into rooms adequate for functions and arranged in relation to each other for safety and efficiency.

3 American Public Health Association-Committee on the Hygiene of Housing

"Planning the Neighborhood"
Standards for Healthful Housing
Public Administration Service, 1948

This volume is the first in a series of three monographs. The later volumes deal with occupancy criteria, and with the construction and equipment of the home, respectively. This report, on standards of the environment of residential areas, deals with the physical setting in which homes should be located. Attempt is made to bring into focus the basic health criteria which should guide the planning of residential neighborhood environment. In the light of these criteria, the committee offers recommendations for the selection of sites and for their development.

4 Bouwcentrum, Rotterdam

"Houses - Study of Elements, A-12, Building Documentation"
1957 - 1961

This loose-leaf document is a regular publication of Bouwcentrum in the field of house building. The reported studies were made during the period of the housing shortage, which arose during, and continued after World War II. The studies cover the influence of new tendencies in modern family life, such as the change of the housewife's task, and the shortage of domestic help.

The starting point of the study was the essential requirements of family housing. These include requirements which evolve from the functions of sleeping, day accommodation and recreation, preparing meals, personal hygiene, doing family washing, etc.. This made it possible to start from the present day of Netherlands cultural pattern, as a basis of study.

In certain cases, however, these can vary, requiring flexibility in the dwelling. In addition, allowance should be made for changes in social conditions. The rise in material prosperity is, as a rule, accompanied by a tendency to copy, outwardly at first, the next higher social class, partly adopting its style of living.

The needs of those who did not come within the general culture pattern are not considered. These are, on the one hand, those who can afford more; and, on the other hand, those who are called "proletarian rearguard", who have little or no housing culture. The solution of the problem for this group requires a separate study.

The study contains a formulation of the minimum space requirements for basic activities which are required in various rooms to insure that they fulfill the real needs of the occupant. Photographs of individuals performing these activities include a measured grid marked on the floors and walls. Space requirements for standard furniture and equipment are also given. In addition, minimum room sizes are identified graphically for space which satisfies these requirements. See Tables I and II, Appendix A.

5 Brill, N.

"Communicating with Low-Income Families"
Journal of Home Economics
P. 631, Vol. 58, No. 8, October, 1966

Barriers of communication and understanding between people exist, even if they use the same language and share a common background. These barriers make it much more difficult to establish understanding between persons of middle-income and low-income families.

To break down these barriers, they must be understood. In addition, the persons with knowledge and service must understand and respect the differences in feeling, due to background. With them lies the burden of responsibility to try to break down these barriers.

There are causes for behavior which must be understood. Leading out of this is the concept that people have the right to participate in decisions affecting their welfare. In work with low-income families, we can utilize this concept by recognizing that participation and decision-making are first steps towards independent action. It is well to remember, however, that people whose life experiences have been destructive often need strong support upon which they can depend before they can move toward self-determination.

We need to learn to use our authority -- not the authority of the "big stick", but the authority of knowledge and skill that we possess -- to help people work to help themselves.

6 Calender, John Hancock, A.I.A., Aureli, Giles, and Bendixen, Warren, 1960

"Methods of Reducing the Cost of Public Housing"
Pratt Institute, Brooklyn, New York
Under a research grant from the New York State Division of Housing

The program was limited to low-rent public housing in the most urbanized boroughs. The work includes planning studies and evaluation of structural systems, the exterior wall, interior elements, and mechanical equipment. The unique feature was the emphasis on cost saving.

The plan studies explored tower schemes, open-corridor schemes, and interior-corridor schemes. The average room area per construction room ranged from 192 to 211 square feet.

A study of revised standards to allow sleeping space in the living room is shown, and the cost saving on the building is estimated at 15%.

7 Champaign, Illinois

"Urban Renewal Plan" for Northeast Project No. 1, Project No. ILL R-67
November 16, 1966

This report contains minimum property standards that set forth minimum requirements for the rehabilitation and/or construction of structures within the Urban Renewal areas, so as to assure reasonable health, social, economic, and aesthetic conditions for the residents. These standards incorporate recommendations for compliance with local statutes, codes, and ordinances, including occupancy of existing structures.

Minimum room areas and dimensions are specified, as well as privacy arrangements, facilities for cooking, bath, laundry, light and ventilation.

See Table I, Appendix A, for room area standards.

8 Champaign, Illinois

"Ordinance Amending Champaign City Code Providing for Minimum Housing Stan
Ordinance No. 335
March 22, 1963

This ordinance was adopted to satisfy requirements for the Federally sponsored Urban Renewal program. It includes the minimum requirements for basic equipment and facilities, ventilation, light, heating, safety, and space.

The space standards state that every dwelling unit shall have at least 150 square feet of floor space for the first occupant, and 100 additional square feet for each additional occupant. Requirements are given for bedroom areas, access to the bathroom, and ceiling height.

9 Ehrenkranz, F.

"Functional Convenience of Kitchens with Different Sink-Dishwasher Locations"
Journal of Home Economics
pp. 711-716; Vol. 57; No. 9; November, 1965

Relative functional conveniences of different kitchen arrangements were evaluated in terms of trips and body turns.

A flexible laboratory space for testing kitchen arrangement was provided with movable wall cabinets with counters, an electric range, counter sink, built-in dishwasher, and refrigerator. The arrangements included "L", "U", and broken "U" assemblies. The dishwasher was located on the left side in some cases, and the right side, in others. Continuous and broken "L" kitchens with dishwashers on the right side of the sink, away from the range-mix center, required fewer trips and body turns during meal preparation than the "same" kitchens with the dishwasher between the sink and the range-mix wall.

10 Federal Housing Administration, Department of Housing and Urban Development

"Minimum Property Standards for One and Two Living Units"
As Revised January, 1965

These nationwide standards were established to provide a sound technical basis for F. H. A. and V. A. mortgage insurance on houses. They define the minimum level of acceptable quality, keeping in mind the dual objective of reaching the needs of the purchasers in low-income brackets; and, at the same time, assuring the purchaser of full value for his dollar.

These standards include space criteria, safety, light, ventilation, construction requirements and land planning restrictions. The space standards provide minimum criteria for room areas, as well as activity space in bathrooms, halls and kitchens, shelf and counter areas for storage in kitchens, and height clearances for the ceilings in rooms and stairs.

The room area standards are listed in Table I, and other criteria in Table II of Appendix A.

11 Federal Housing Administration, Department of Housing and Urban Development

"Minimum Property Standards for Low Cost Housing"
HUD PG-1, October, 1966

The purpose of these minimum standards for low-cost housing is to encourage the construction of housing designed to meet the needs of low-income families, particularly those not eligible for participation in other F. H. A. mortgage insurance programs.

In the development of these standards, emphasis has been placed upon the characteristics which will assure housing that is structurally sound and durable, has reasonably low future maintenance, and is well-planned for the needs of the occupants.

The quality of housing acceptable under these standards is somewhat below that of the Minimum Property Standards for One and Two Living Units in several respects. The principal relaxations involve planning standards, where aspects of shelter over convenience predominate; exterior and interior covering materials, where a lesser quality of finish is permitted; and the elimination of certain improvements which the typical purchaser can complete after insurance, without special knowledge or experience. The standards do not attempt to provide an absolute minimum degree of shelter, structural strength, or durability.

Acceptability criteria cover site conditions, service and facilities, access to the property, construction, exterior and interior finishes, mechanical equipment, light and ventilation, fire protection, access, and space standards.

Room area standards are listed in Table I and other criteria in Table II of Appendix A.

"Minimum Property Standards for Multifamily Housing"
No. FHA 2600 - As Revised Feb., 1967

These nationwide standards were established to encourage the provision of housing projects that meet the special needs of urban families, and to protect the interests of the Federal Housing Administration in the projects.

Their chief emphasis is in features of planning, design, and construction that will provide structures and facilities for a healthful residential environment, with continued desirability, soundness, and safety, all connected with anticipated rentals.

The section on Building Planning establishes criteria for accommodations which provide adequate space arranged and equipped for suitable living, sleeping, cooking, dining, sanitation and storage facilities for use of the occupant; and to provide adequate space, conveniently located, for necessary utility and service functions for the common use of the occupants. The minimum room area criteria are listed in Table I of Appendix A. In addition, minimum criteria are established for ceiling heights, hall widths, closet depths, kitchen shelves and cabinet area and clearances. These are listed in Table II of Appendix A.

13 Federal Housing Administration, Department of Housing and Urban Development

"Minimum Property Standards, Housing for the Elderly - With Special Consideration for the Handicapped"

This is another revision of the standards set forth in the Federal Housing Administration Minimum Property Standards, which has been made to fit the needs of the elderly and handicapped.

The area space standards for rooms, as shown in Table I of Appendix A, are very similar to the original criteria. Special considerations for the type of occupants include the reduction or elimination of dining and kitchen space where proper central facilities are provided, and the reduction of the primary bedroom area to 100 square feet in rooms for single occupancy.

The requirements are established to allow accommodation for sleeping in the living-dining rooms. This allows space for the bed, dresser, and bed activity requirements. Shower stalls are acceptable in lieu of bath tubs, if central bathing facilities are adequate. Standards are also given for ceiling height, kitchen storage and counters, privacy, noise reduction, light, and heating.

14 Federal Housing Administration, Department of Housing and Urban Development

"Minimum Property Standards for Urban Renewal Rehabilitation"
No. 950 - Revised 12/63

These Minimum Property Standards have been developed to provide a guide to minimum design and construction standards for rehabilitation of neglected and run-down houses located in specific Urban Renewal areas. They recognize the difficulty of determining the appropriate level of rehabilitation required for all individual properties in an area. The standards must be high enough to restore economic and social health, yet low enough to keep the cost of improvement within the reach of the present residents.

For these reasons, the standards take a two-sided approach. First, they establish the minimum permissible level for essentials, such as protection of health, safety, appropriate plumbing facilities, privacy, and soundness of weather resistance. The second side identifies physical improvements which are recommended, but not mandatory.

The criteria for minimum room area are listed in Table I, and other criteria in Table II of Appendix A.

15 Hall, E. T.,

"The Hidden Dimension"
New York, 1966

This is a report on man's mental and emotional reaction to the social and personal space about himself and his fellows, and how he maintains space around him in his home and his office.

Peoples of different culture live in different sensory worlds, which modify their standards of distance regulation. For instance, Arabs maintain a different distance during conversation than do Americans. He reports that two of the cultures of creative and sensitive peoples in America are flocking to the cities, where they are being seriously stressed by the conflict of lack of space.

He reports that comprehensive research on animals establishes that each has different standards of territoriality. He quoted Zurich, H. H., who says that "Territoriality insures the propagation of the species by regulating density".

Western man's immediate space needs are divided into four categories: intimate, personal, social, and public. The difference between these standards for peoples of different nations and languages is discussed.

16 House Beautiful

"Closet Space that Moves with You"
Ellestad, J.
Pp. 92-93, Vol. 104, No. 7, July, 1962

One way to be sure of enough clothes closets wherever you live is to carry them with you in the form of wardrobes, armoires, and chests. The idea is not new, but the aesthetic improvement is. A wardrobe need no longer proclaim itself by its bulk, but may look like an architectural built-in, enhancing rather than encumbering a room. Fitted out with drawers, trays, shelves, and sliding hanging rods scaled to the size and shape of the clothes they will contain, these modern wardrobes make full use of every cubic inch of interior space.

17 Housing Assistance Administration, Department of Housing and Urban Development

"Low-Rent Housing Manual" - 207.1
September, 1963

This is a manual for planning and design of low-rent housing to be erected by local housing authorities with financial assistance from the Federal Government. This establishes maximum area criteria which are mandatory. These vary for occupancy capacities and room count. See Table IX, Appendix A.

In addition, requirements are established for the furniture to be accommodated, to permit free circulation with due allowance for heating devices, door swing, accessibility to electric outlets, etc. See Table VIII.

The precise room sizes and space for storage, equipment, and activities are left to the judgment of the architect and local housing authority.

18 Housing Assistance Administration,
Department of Housing and Urban Development

"Low-Rent Housing Manual" - 221.1
September, 1967

This is a manual for the provision of housing for low-income families by the "turn-key" method. This method permits a developer, who has a site, to propose to build housing for low-income families, who will be granted financial assistance.

Maximum area criteria for the dwelling for different numbers of occupants are established, with separate criteria for the elderly. In addition, guide lines for minimum area of rooms, which are not mandatory, are given. See Table VII of Appendix A. The precise room size to be established is left to the determination of the architect and the local housing authority. It will depend on the requirements of the families to be housed and financial feasibility.

Hoyt

"A New Approach to Standard of Living"
Journal of Home Economics
Iowa State College
pp. 56 Vol. 51, No. 2 February 1959

society, the significance of the compensatory aspects of the protective elements are throwbacks to the past. Even if something could be had, these throwbacks are desirable to help people keep their bearings in times of change.

In the judgment of the standard of living of other people, we must avoid the error of assuming people's reasons for choices are the same as ours. A new foreign administrator in the African uplands misunderstood the reason and forbade the natives to sleep with cows in their huts. When it developed that in the cold nights the people had no means of securing warmth, the administrator had no substitute to give them. If a convention which serves the people is to be given up, an equally good means to security should replace it.

It has again and again been pointed out that people endeavor to excel in their clothes or their cars before they reach conventional standards of housing. It takes longer to acquire the conventional standards of housing of a community, and a quick impression is made better by one's clothes or one's car. In societies undergoing rapid change, there are many such examples of compensation, and sometimes extreme ones.

Among the expansive elements, the single one which stands out above all others is education. Travel is to some extent expansive. Recreation and religion can have strongly expansive elements, but they also have others. The expenditure for almost anything can be expansive.

Food for nutrition is protective, but sharing of food in hospitality is expansive. When we entertain, we eat more expansive foods than ordinary, and create an atmosphere of social stimulation. To raise our level of expenditure for housing can provide for expansive standards. This is important, because the house is also a home, a place where the members of the family can gather, where friends meet, where new skills, new arts, and appreciations can be learned. Household operation, equipment and furnishings may be expansive also, when their use leads to other aspects of the standard of living in new directions.

The third category of elements, "destructive", appears where there is undue stress in the standard, and these elements are often compensatory elements carried too far.

It used to be assumed that when protective elements in the standard were lacking, these standards should be supplied before anything else is done. A good example is food. It was commonly said that malnutrition problems must be solved before support of needs less definite.

In considering social policy, protective elements, such as food, can be given to people easily, but this does not help the people raise their standard of living. These programs have often failed in constructive results later. It is true that undernourished people cannot do their best work, but is also true that if the impetus for "best work" is not present, the food alone will not supply it. But, when expansive elements are given to people under a carefully thought out program, people have to do something for themselves. In our foreign programs, we are now putting much more stress on technical assistance, which is designed to be expansive, rather than handouts, which are protective.

But, social policy can be too expansive. In all history, the most outstanding example of expansion out of proportion to protection is that of Athens in the 5th Century, B. C. The cause was an uncontrolled plague which could have been controlled by sanitation. Athens "chose Beauty for Security to build her temples on the Acropolis rather than lay water pipes".

20 Jones, R. A.

"Household Storage Study"
University of Illinois
Small Homes Council - Building Research Council
Research Report 63-1; July, 1963

This is a review of and recommended improvements in the standards for storage facilities as specified in the Minimum Property Standards for One and Two Living Units of the Federal Housing Administration. It is based on a review of literature and the recommendations of a committee of specialists.

The committee did not recommend an increase in the total storage space. Instead, their efforts focused on better distribution and accessibility of storage. Improved accessibility can be achieved through greater opening widths.

It was recommended that the storage space for clothes in the master bedroom be expanded to provide better storage for two people. The expansion in the criteria for bedroom closet space was offset by equal reduction in the criteria for general storage space.

?1 Kapple, William H.

"Kitchen Planning Standards" (Revised edition)
University of Illinois, Small Homes Council - Building Research Council - Urbana
Circular Series C 5.32, 1965

The circular covers kitchen planning principles, with variable space standards, for construction with stock manufactured cabinets and equipment. This circular updates the criteria established in an earlier issue, to incorporate the needs for new equipment such as the dishwasher and separate range and oven. The standards presented range from minimum to liberal, and are related to the total house size.

The scoring system provides criteria for evaluating storage, counter frontage, appliance space, activity space, windows, and safety.

Required room size, under these standards, is evaluated in Wanslow's "Kitchen Planning Guide", Item No. 37 in this Appendix.

22 Keiser, M. B., Weaver, E. K.

"Body Measurements Related to Energy Used"
Journal of Home Economics
Ohio Agricultural Experiment Station
pp. 479-482, Vo. 54, No. 6, June, 1962

A technique was developed for measuring angles of arm and leg movements. Motion pictures were made of two subjects engaged in bed making, and ten in climbing stairs. The pictures were projected on paper with polar coordinates, and the angle of movement determined for body bend, knee bend, and reach.

Energy expenditures for stair climbing were determined by an indirect method of calorimetry.

When the bed was raised for one subject, the energy expenditures and the angles of movement all decreased as the bed raised. These factors were decreased for both subjects at bed heights between 20" and 26".

Correlation between angle of knee bend and energy expenditure and stair climbing was more significant than with any other body measurements made in the study.

23 Klaber, Eugene H.

"Housing Design"
Reinhold Publishing Company
New York, 1954

This book is for those concerned with the physical design of housing. It is based on the author's nine years of government service in housing. The housing discussed is for families of low to moderate income. There is no great difference in the basic housing needs of "rich" and "poor" families.

Space should be planned for the furniture that occupants will use, to be sure that doors, windows, and necessary circulation do not preclude the placement of an adequate number of pieces. Furniture is assumed to be of the largest common size. The same furniture sizes should be used for low-rental projects, because such families will use second-hand furniture or cheap furniture both of which will usually be of the large size.

Plan dimensions and some clearances are given for standard furniture in the living room, dining room, and bedroom. See Table I and II of Appendix A.

Some efficient plans are identified. They are not presented as a model to follow, but are included to illustrate a method of study. It is noted that the greater livability of these rooms is not due to their size alone, but is due to better space distribution.

It is not enough to assure decent, safe, and sanitary housing in order to cure social maladjustment. The program must also consider the environment. The lives of people housed in many of our cities are adversely affected by drab and ugly surroundings, by noise, dust, and industrial odors. They are affected by inadequate public services: improper care of health and education; by the lack of recreation and school facilities; by congested traffic. A successful housing program must come from a careful study of the ways of life of those who occupy the housing.

Tthe lower the income, the greater the likelihood of overcrowding. As far as possible, the various activities of the family should be kept separate. For families with children, a sleeping shelf opening into the living room is unusable. A boy of fifteen and another of five will not be happy sharing the same bedroom; nor will girls of the similar ages. If the children are compatible, the bedroom should be sized for twin beds.

24 McCullough, H. E., Philson, K., Smith, R. H., Wood, A. L., and Woolrich, A.

"Space Standards for Household Activities"
University of Illinois Agricultural Experiment Station
Bulletin 686, May, 1962

The standards here reported resulted from studies carried on at four State agricultural experiment stations; Alabama, Illinois, Pennsylvania, and Washington, and at the Clothing and Housing Research Division of the Agricultural Research Service, U. S. Department of Agriculture.

They were derived chiefly from detailed measurements of the activities of 230 women, and a more limited set of activities for 20 men. The 230 women ranged in age from 20 to 70 years, in height from 58 to 74 inches, and in weight from 90 to 225 pounds.

The study established that work habits may be as important as size, age, weight, or body build in determining how much space each activity requires. A small woman, who habitually stands back from equipment as she works, may use more space than a larger woman who stands close to it.

A pilot study identified the part of each activity requiring the most space, thus reducing the number of required measurements in the cooperative study.

The recommended standards resulting from this study are shown in illustrations. The final recommendations were adequate for a minimum of 82% of the tested persons on some activities and for all activities for others. No data is reported on the median or medium space, or on aspects of performing the activity in lesser space when necessary. The use of these standards are recommended to provide satisfactory space for most women in the United States.

A limited number of floor plans are given to show the relation of activity space to furniture and equipment in bedrooms, kitchens and dining areas.

These standards identify horizontal and vertical clearances for activity space. See Table II in Appendix A.

25 McCullough, Helen E.,

"A Pilot Study of Space Requirements for Household Activities"
Journal of Home Economics
Volume 47, January 1955

This is a report of the preliminary investigation of a broad research program and space standards for the house. Its objectives were to test the methodology suitable for measuring space for activities, and to serve as a guide for a cooperative study in which enough homemakers can be measured to establish standards which are statistically acceptable to establish space needed to use all of the major kinds of household furniture and equipment. See "Space Standards for Household Activities" for the final report.

The study was made with six women of different size, and two men. More than sixty body measurements were made. The space required for activities with the use of twenty-one pieces of household equipment and furniture were made for the women; the two men were tested for a limited number of these activities. Determinations were also made for the space required for walking, and for two people to pass.

The chief equipment used for measuring was a steel tape and movable wall panels. The average of the space used in six trials for each of the major steps of the activity was recorded for each cooperator. Six trials of each cooperator in each step of the activity gives sufficiently accurate results to determine the space needed by individuals for specific activities. The use of the average space for all cooperators is not recommendéd, since it would not be adequate for some of the cooperators. Photographs, which give a permanent record of how the individual works, are an invaluable aid in analyzing the data.

Table 2 of the report lists "the maximum space required for each cooperator". Review of Miss McCullough's report on Project 707, Illinois Agricultural Experimer Station, HE-750 - March 1955, shows that the space reported is actually the average of six trials.

26 McCullough, Helen E.

"Space Requirements for Household Activities"
Project 707, Illinois Agricultural Experiment Station, March 1955

This report is essentially the same as the previous listing, with the exception that the review of literature covers results of measurements of the human body, and a few on space requirements to carry out household activities. The appendix contains the results of an out-of-print report on "Standards of Working-Surface Heights, and of Other Space Units of the Dwelling", by: Roberts, E. H., Wilson, M., and Theyer, R., Oregon Agricultural Experiment Station, Bulletin 383, and Washington Agricultural Station, Bulletin 345, 1937. This earlier study was made to supply some of the information required to set up standards for dimensions of the parts of the house that are used mainly by women.

27 McCullough, Helen E.,

"Cabinet Space for the Kitchen"
University of Illinois, Small Homes Council, Urbana
Circular Series C5.31, 1949

A report on research to study storage space needs in the kitchen and enumerate principles of planning the work area and arranging the cabinets.

The standard lists of items to be stored are established; one, limited, and the other, liberal. Charts establish minimum and ample wall and base cabinet requirements. These, in turn, are combined with the space required for appliances, to project the total wall space needs.

28 McCullough, Helen E.,

"Household Storage Units"
University of Illinois, Small Homes Council, Urbana
Circular Series C 5.1

A report of a research program to study the principles of accessibility, economy, and flexibility in household storage.

Minimum dimensions are established for the depth, width, and height of various storage spaces. Three depths are established for standard units. Different standards are established for the other dimensions for storage units to accommodate dinnerware, books, toys, desk supplies, record players, musical instruments, bathroom supplies, work clothes, sports equipment, cleaning equipment, clothing, bedding, luggage, card tables, table linens, folding bed, sewing equipment, and infants equipment.

29 National Housing Agency, Federal Public Housing Authority

"The Livability Problems of 1,000 Families"
Bulletin #28; October 1, 1945

This is a study of 1,062 families living in aided public housing. It analyzes the adequacies and inadequacies of area, equipment, facilities, design features, and materials that affect the livability of the dwelling.

It is based on interviews with both tenants and managers. About one-third of the families were interviewed in 1942 and the remainder in 1945. Recommendations are given for improving the aspects of the standards previously established by the F.P.H.A. that appeared to be adequate.

Unit overcrowding was surprisingly great, due chiefly to the unavailability of larger units. About 40% of the families were five persons or more. The report discusses the requirements for the living room, kitchen, utility room, closet, bedroom, bathroom, and laundry. See Tables II, IV, V and VI, of Appendix A.

The effect of family size and family possessions and space needs is described for the different areas of the house. The area criteria for the living room are related to the family size, and the bedroom sizes are related to the bed sizes and furniture.

Many bedrooms were found to be inadequate because families used two single beds instead of a double bed for a room with children, and they used a double bed instead of a single bed in a room planned for one person.

The findings obtained in the study revealed two major fallacies in space planning: (1) the failure to realize that family possessions are not of minimum size, and cannot be accommodated in minimum spaces; and (2) that the equipment requirements of household operation are far greater than the storage space required. Inventories of family possessions with dimension specifications are only guides, and some flexibility in space provided is necessary for occasional extra items needed. Future planners of houses to designed endure for forty years or more should not fail to consider improved standards of living, particularly those concerned with health and household hygiene.

30 National Housing Agency, Federal Public Housing Authority

"Public Housing Design - A Review of Experience in Low-Rent Housing"
U. S. Government Printing Office, June 1946

This review, a summary of experience gained during more than a decade in planning low-rent developments, is offered to point some mistakes and to chronicle some solutions of problems encountered. Unlike the "Minimum Physical Standards and Criteria for Planning and Design of F.P.H.A. Public Housing Projects", published by the F.P.H.A. in 1945, it contains no rules which must be followed to satisfy legislative requirements.

Minimum standard sizes may be poorly suited for their purpose if they do not take into consideration the kind, number, size, and placement of normal furnishings, household equipment, and utensils and supplies of all sorts; including those used frequently, and those used only occasionally and requiring storage for a long period.

The book also quotes from "The Livability Problems of 1000 Families". Following are statements that describe space needs.

Inside and outside recreation facilities should be provided, and provision for home study should be made for families with children.

The kitchen is the shop, laboratory, town hall, and general headquarters in public housing. In addition to cooking and dishwashing, it is used for; dining by 89%, entertaining by 25%, children's study by 32%, children's recreation by 52%, clothes drying by 32%, ironing by 82%, sewing by 27%. In addition, it is used for care of the baby, and making general repairs. There were serious objections to the need to carry garbage, clothes, etc. from the kitchen through the living room to the individual's yard. Tenants almost unanimously preferred a definite separation between the kitchen and living room.

Many living rooms do not have maximum use, because they have the families' choicest possessions. The living room is used for children's recreation by 80%, children's study by 38%. It is sometimes used for dining, and planned for sleeping, However, most families prefer to sleep in the bedroom, even if it results in overcrowding. Planning to accommodate guest sleeping in the living room is recommended.

Most families prefer to dine in the kitchen. If possible, it should command a pleasant outdoor view. The West reported dining in the living room as especially important if laundry is done in the kitchen.

A larger proportion of the bedroom floor area is occupied by furniture than is the case with other rooms. Windows and doors account for a large proportion of the walls and partitions. These facts make tidiness in bedrooms difficult. The room should be large enough for a 9' x 12' rug, and for a double bed. No twin beds in projects visited (Pennsylvania). Windows should be low enough to see out while sitting, and to attract a breeze when in bed (California).

Placing the water closet adjacent to the tub in the bathroom provides a handy seat for the mother drying small children. An approach to the bathroom through a bedroom complicates possible use by guests and by family members sleeping in the living room. Women like tubs, men like showers. A shower in the tub is a good answer.

In addition to normal storage in kitchen cabinets, broom closets, linen closets, bedroom and guest closets, there are needs for: cool storage, for food of families without necessary refrigeration (or who store garden produce); toy storage, which is demanded most vociferously; and general storage, preferably in the basement. In basementless dwellings, the general storage should be within the unit. When possibl grade storage should be made for perambulators and bicycles.

Adequate provision for the laundry may be made centrally or in the dwelling. Facilities in the dwelling include a deep tray in the kitchen, space for operating a washing machine (and its storage), drying space outside, or if necessary, inside, and storage space for the ironing board and its accessories.

Recommendations are also given for planning of stairs and stair halls, porches and household safety.

31 Nichols, A., Russell, T. S., Wood, A. L.

"Space Requirements for Use and Care of Laundry Appliances"
Journal of Home Economics
pp. 185-189, March 1961

This study identifies the variation of clearances in front of equipment required to perform laundry activities comfortably and efficiently for washers and for dryers, each with three different types of openings. Measurements of the activity spaces were collected on a stratified sample of 36 women. Movable walls were placed in front of the appliances, while basic laundry activities were performed. See Table XII in Appendix A.

The measurements are given for three sets of washers and dryers used in the experiment. Each set had different types of doors. See Table XI in Appendix A.

The space allowances recommended ranged from 28" to 42", depending on the appliances and activities performed. With an allowance of 42", 95% of the subjects could perform all of the laundry activities relative to the use and care of any appliance.

These results support McCullough's findings that body use is more important than body size as a space determinate. Where comparable, here space requirements were somewhat higher, perhaps because of the floor space for laundry basket.

This report is based on "Scientific Paper No. 2016, Washington Agricultural Experiment Station, Pullman. Project No. 826.

32 Ramsey, C. G., and Sleeper, H. R.

"Architectural Graphic Standards for Architects, Engineers, Decorators, Builders, and Draftsmen"
Fifth Edition; May 1956

This is an illustrated reference on standard construction and planning practices for all types of construction, with complete information on planning criteria for residences.

Special care has been given to preparation of drawings that illustrate all standards. The criteria for household planning include sizes of furniture, equipment and recommended clearances for activity. See Table II in Appendix A.

Basic types of rooms are illustrated to indicate the use of the criteria, illustrating recommended sizes ranging from minimum to very large. These are illustrated for the living room, kitchen, dining room, bedroom, and bath. See Table I in Appendix A.

33 Schmidt, John L., AIA; Lewis, Walter H., AIA: Olin, Harold Bennett, AIA

"Construction Lending Guide - A Handbook of Home Building Design and Construction"
United States Saving and Loan League
As amended Oct. 1967

This guide was published to help home lenders evaluate accurately the design factors, construction techniques and materials which affect the long-term value of the home.

The guide consists of five separate sections on Land Planning, Design, Construction, Appraising, and Construction Loan Procedures.

A guide for space planning is given, but is not intended to serve as a manual of minimum standards because room size alone can be misleading. The shape, layout, and relation to other plan elements are just as important as dimensions.

A well-planned living room avoids cross-traffic. A relatively small living room is more compatible than a large room. The living room may be too large for the ideal conversation circle, approximately 10' in diameter. The size of a dining room must be adequate for circulation through the room. The guide for bedroom planning suggests activity space around the furniture, furniture space, and access space for doors and closets. The kitchen guide establishes cabinet frontage, storage, and activity space criteria.

Minimum room size recommendations are listed in Table I, Appendix A.

34 Schroeder, Frances De N.

"Anatomy for Interior Designers"
Whitney Publishing Company, 1946

The fundamental measurements of the human anatomy are illustrated, as well as examples of dimensions and clearances for comfortable furniture, and stairs and passageways of houses, offices and restaurants. Additional illustrations establish the dimensions required for serving and eating, lounging, conversing and recreation, and storage.

35 United Nations

"Manual on Self-Help Housing"
Department of Economic and Social Affairs
New York, 1964

This manual identifies the background on the world's housing needs for low-cost housing. It states that, with maximum self-help measures, costs may sometimes go as low as $500 per dwelling unit for urban dwellings, and $200 per dwelling unit in rural areas; and even at these costs, are probably beyond the means of most families today in the developing countries of Africa, Asia, and Latin America.

The permanent house sizes needed depend upon many factors, the most important of which are: family size, family income, financing resources, availability and cost of land, building materials, and acceptable social standards. Good design must consider the conditions of climate; geography of the site; animal, reptile, insect, bacterial and chemical conditions; and danger of fire. In addition, some houses must include outdoor and interior open space for privacy for animals.

Self-help houses have varied in size from one large room 10'-0" by 16'-0" to 1,000 square feet. As a rule, any standard, well-constructed house of 400-800 square feet can be found in most countries, and could be built by organized self-help groups. In order to build the smallest possible houses for the lowest income families, it is important to make these houses expandable. It is also important that the designer do social research and meet with prospective home builders, continuing observation of the use to which the living spaces are put, in order to obtain valuable information for future improvements of low-cost houses.

"Bedrooms and Clothes Closets"
House Planning Aid
U. S. Government Printing Office
Publication No. 1004, August, 1965

This four page leaflet illustrates recommended minimum space for various bedroom activities, and minimum room sizes for optimum arranged furniture with standard beds. See Table I in Appendix A.

Closet rod length and depth criteria are given.

37 Wanslow, Robert

Kitchen Planning Guide
University of Illinois
Small Homes Council-Building Research Council
August, 1965

Results of graphic analysis conducted by the Small Homes Council-Building Research Council on the sizes and shapes of rooms which can efficiently accommodate a complete kitchen assembly.

The series of plans was developed to satisfy the requirements of the kitchen scoring system developed by the Small Homes Council-Building Research Council in Circular C 5.32 (Item 21).

The plans demonstrate that a good kitchen can be provided in 58 square feet if the doors and windows in the work centers are properly located. Comparison of the plan shows the liberal kitchen can be provided instead of the minimum kitchen with an increase of 20 square feet in floor area.

The guide includes a detailed description of planning standards for storage, counter, centers, work triangle, space for activities, doors and windows, ventilation, lighting, and safety.

38 Wickenden, E.

"The Legal Right to a Minimum but Adequate Level of Living"
Journal of Home Economics
Pages 14 - 19; Volume 59; January, 1957

No public benefit conditioned on "need", "poverty", "income deficiency", "a means test" (choose your term, but the reality is the same) is ever going to be as satisfactory to the person on the receiving end as one which does not make distinctions between the "haves" and the "have-nots". And, this is true, whether the benefit is called "public assistance", "a poverty program", "public housing", "rent supplement", "stamp plan", "child nutrition", "low-income educational aids", or "a negative income tax". These are all expedients for alleviation of poverty. Of course, so long as we tolerate the poverty, the alleviative remedies will be necessary, and should be improved. But, we should set our sights on preventing poverty before it occurs.

Instead of these measures of relief, the author recommends a combination of programs, including "a guaranteed job", "a guaranteed annual wage", "guaranteed replacement income" for the old, "guaranteed health provisions", "guaranteed public education", and "guaranteed social services".

Any program which assumes the continuing willingness of the self-supporting tax payer to subsidize generous recurring appropriations for a major portion of his fellow Americans, which are already a burden on the public assistance system, is unsuited for the current political and financial pressures. These defeatist assumptions are not necessary. We have the means and the faith in our own democratic capacities to make the great society one in which poverty that needs to be relieved is the rare exception.

Withrow, J. L., Trottern V. Y.

"Space for Leisure Activities of Teenagers"
Journal of Home Economics
pp. 359-362, May, 1961

To evaluate the space and equipment available for leisure-time activities of teenagers and adults, 30 families were interviewed in Lincoln, Nebraska. Information was collected regarding leisure-time activities, frequency of participation, site of activity, equipment used, and its place of storage.

The size of the families ranged from three to nine. More than half of the families reported incomes above $5,000, and about one-third of the parents had attended college. More than two-thirds of the houses had seven or more rooms, and all were in sound structural condition.

Tables XIII and XIV of Appendix A, taken from this report, summarize the leisure activities in which the sample families most frequently participated. The most common location and most frequently occurring equipment are listed in these tables. The report also lists the family member (teenager or parent), total number participating, number participating once a week, and number of families storing equipment.

Too many activities of a diversified nature were carried on in one room, and not enough use was made of available space.

The list of activities was divided according to the nature of the activity. See Table X. Some of the activities might well be carried on in different locations, depending on other family members' activities at the same time.

Three distinct areas for leisure activities were recommended: private, social, and active. Within these three areas, space can be developed for more than one use by arrangement of furniture in the groups, and according to use or the construction of storage units.

Private and quiet activities are best carried on alone in a room or in a room where other people are doing quiet activities. Social activities tend to exclude other members of the family at the time. The activity area can be planned as a second social area to reduce this conflict.

JUNE 1968

THE ROLE OF SOCIAL NEEDS OF THE URBAN POOR IN DETERMINING PERFORMANCE STANDARDS FOR HOUSING

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I. INTRODUCTION

The combinations of multidisciplines appropriate to the diverse fields suggested by such terms as "poor,""housing,""needs,""urban," "performance standards," and "social" present a scope of effort of overwhelming proportions. At the same time these terms constitute the reference points of a national trauma. The urgency attending the trauma has expanded these subjects from the province of the soft scientist and professional to the larger domain of the general public. Informal radio and television panel discussions, newspapers, and magazines compete daily with the traditional specialist journals as information sources. The confrontation between discipline groups and urgent trauma presents a classic conflict. Discipline activity is analytically inspired. It searches, surveys, explores and finally documents. The operational demands of urgency, however, are directed toward action and change, and gravitate to a sole criterion: relevance. The approach adopted in this report, therefore, has been to determine the central issues of each topic, relate and connect these issues within a consistent social housing view point, and then attempt to formulate their operational implications.

In this report, the category of urban poor has been directly equated to the poor Negro in the urban ghetto. No effort has been made to validate this premise. To those who accept it, further elaboration would be a superfluous exercise; to those who reject it, supporting arguments beyond the content of the report itself are not likely to be convincing.

Whitney Young and Kenneth Clark have repeatedly observed that the massive research efforts on the urban Negro is approaching grotesque stages. The tolerance and patience that the Negro has exhibited to being researched should not be exploited. This situation has been a primary influence both in our pursuit of operational relevance and in our conclusions.

The usefulness of this effort begins and ends with the three proposals which conclude the report. The Department of Housing and Urban Development (H.U.D.) must decide whether the implementation of these proposals can appreciably contribute to the successful accomplishment of its mission. In its evaluation, recognition should be given to the absence of any reference to existing H.U.D. "Minimum Property Standards." It is this quantitative approach of existing housing programs which must give way to a more responsive system of performance standards based on a variety of social needs. In the past, the decision of not introducing social needs into the process of translating product-solution standards into performance standards was a crucial one. It took decades to discover that simply replacing inferior housing with adequate, new housing was irrelevant to the reality of the ghetto slum. The role of social needs of the urban poor in determining performance standards for housing poses the additional responsibility of balancing several programs, each having a different goal. H.U.D. will have to consider the alternative--what are the possibilities of public housing for the urban Negro to be socially relevant if the directions indicated in the proposals are ignored?

II. HOUSING

A. Burden of a Legacy

The evolution of governmental intervention in housing has been influenced to an extraordinary degree by the environment and ideology of its origin. The gradual, legislatively sectional elaboration of national policy on public housing has consequently been burdened by a legacy of considering housing in the context of a non-social, asocial, and only incidently, as a social endeavor. From the beginning of its involvement in the early thirties, government has viewed the problem of housing in terms of inventory. Statements regarding housing goals and objectives did not go beyond the level of the grand abstractions--more housing, better housing, housing for all. The call for action, and its underlying rationale, was not unlike that for the transportation problem--more highways, better highways, highways for all. Because inferior housing conditions are graphically visible and measurable they occupied an important part of the reformer's brief. Ironically, these specific housing data were more effectively employed to support action on poverty and general welfare than for housing programs.

Housing, a significant sector of the national economy, has been further estranged from social needs by its use as a means of manipulating economic behavior and cycles. The goal of "a decent home for every family in a suitable enviornment" established by

the Housing Act of 1949 was obscured by the stated goal that the Act "is necessary to enable the housing industry to make its full contribution toward an economy of maximum employment, production, and purchasing power." Symptomatic of the market place and real estate function of government housing is the influence of the filtering process by which housing, as well as other hardware, e.g. automobiles, is passed down through the various social strata as its economic value and social desirability diminish. The concern for "price change," "shift in occupancy," "depreciation," and "stock flow" which relate to filtering contribute however inadvertently to asocial perspectives. By stipulating that new public housing conform to the attitudes and patterns of existing neighborhoods , the Housing Act of 1937 tacitly supported segregated housing. In this respect, the unfortunate influence of this Act must be regarded as a failure to properly structure and define the social responsibilities of housing rather than as a conscious attempt to practice racial discrimination.

The Romantic ideal in which rural virtue is contrasted to urban vice may be obsolete, but its influence still survives. With the assistance of government financing, salvation from urban sin was to be accomplished by practicing the virtue of home ownership. In practice, this assumption of an all inclusive middle class has affected even the housing programs with the most explicit and direct concern with the urban poor. Qualification for

obtaining public housing has been specified in terms of a quasi-middle class group called the "deserving poor." What remains completely absent are performance criteria for the needy poor. Although their intentions may be benevolent, minimum property standards based upon middle class values are a tangible demonstration of the discontinuity between the social needs of the urban poor and the housing rationale.

B. Housing Goals

Whether by intent or inadvertent result all housing must correspond to a pattern of goals which reflect the technological development and economic level as well as the values and aspirations of society. The first official intervention on housing took place in 1837 when a New York City health inspector reported the connection between housing conditions and the spread of epidemics. The goal, in this case, is motivated by the self-protection of people outside the substandard housing as much as by a concern for the inhabitants of the housing that nurtures and transmits disease. In 1867 the goal of health and safety was formulated in the tenement housing law by the New York legislature. Before the fundamental standard of ventilation was required in 1879, however, 350,000 windowless rooms had already been constructed. Spurred by the social concern of a small but vigorous group of individuals and organizations, municipalities gradually progressed

toward the more encompassing goal of shelter.

For government housing, that is, government financed housing, the goals were those dictated by the real estate standards of mortgage investment. The market place demand for a suitable living environment was immediately translated into the new goal: amenity. The conflict created by the disparity between the goal of amenity and the realistic housing needs of the urban poor was inevitable. Its ultimate effect was to exclude the poor with the most pressing housing needs from receiving direct assistance from the government and left them with only the passive hope that the benefits of filtering would reach them. This is not a commentary on the viability of the filtering process. Nor should the fact that filtering does not directly relate to the housing needs of the poor necessarily compromise its potential contribution. What must be recognized and underlined is that when filtering fails to function it is that group of poor least prepared which is most vulnerable, indeed, the victim of its failure.

The progressive influence of social needs on housing goals is shown in Fig. 1. The urban renewal and development programs, the use of community facilities, and more recently, the Demonstration Cities Act, are an indication that the goal of amenity has been generally accepted. Nevertheless, the concept of the undeserving poor survives and places a precarious ceiling to the

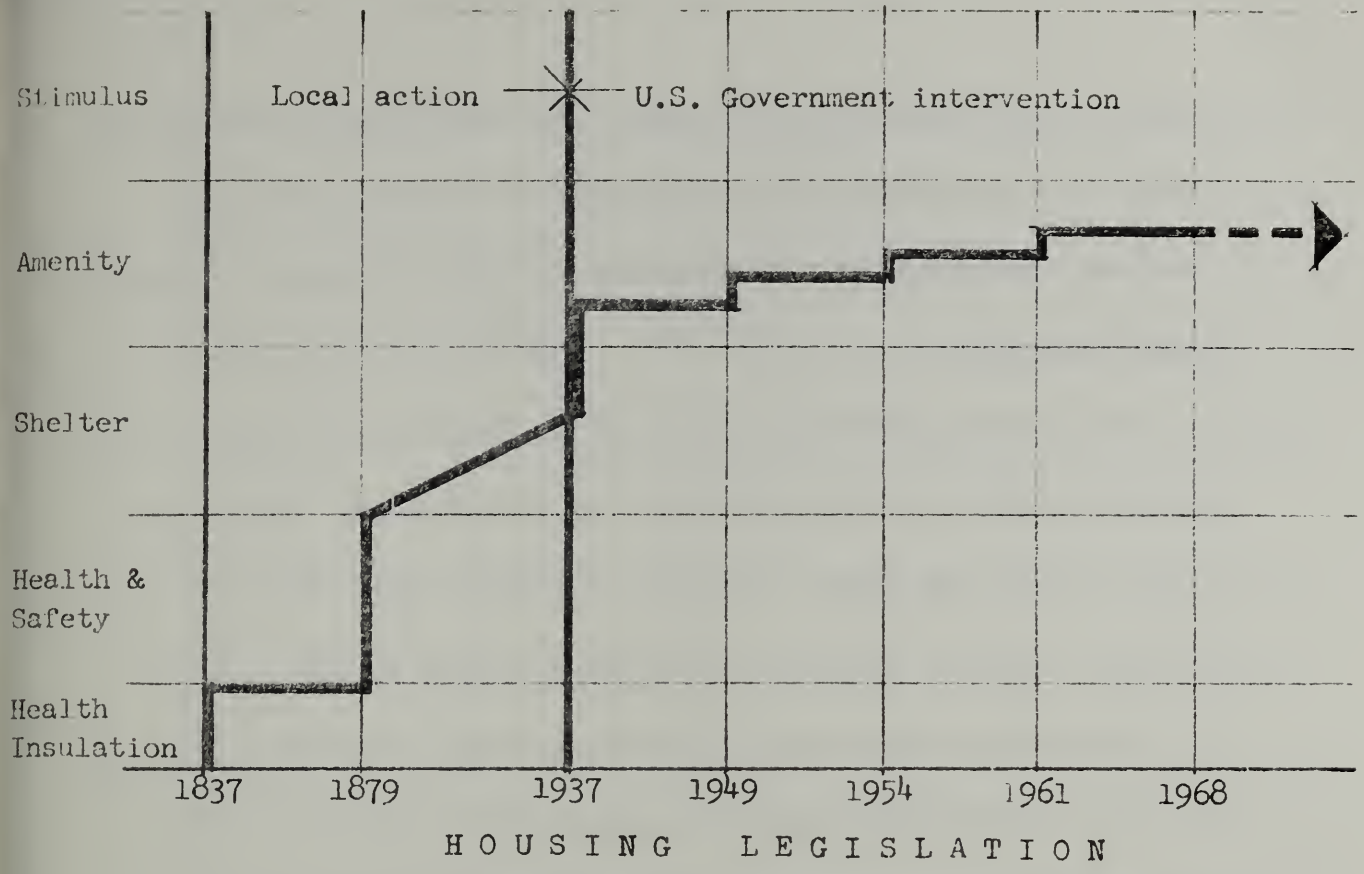


Figure 1. SINGLE GOAL HOUSING

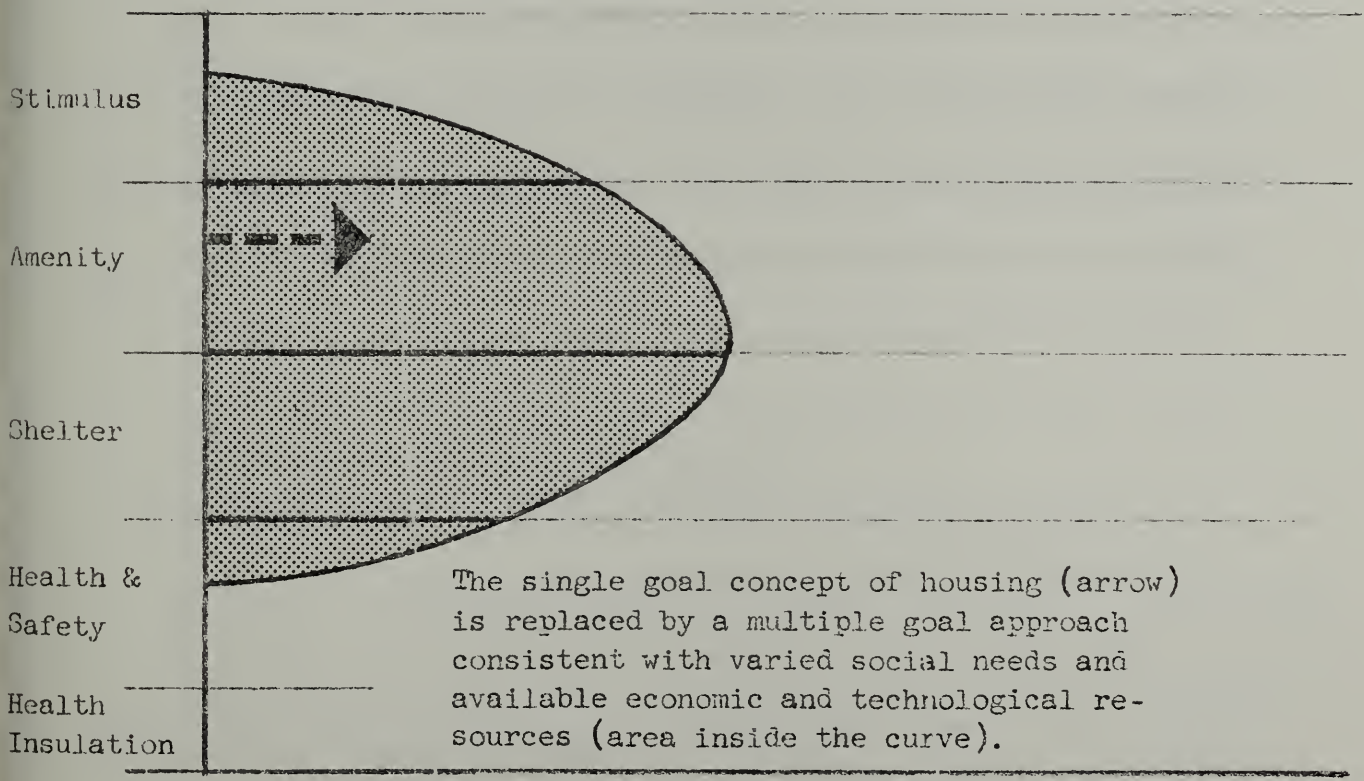


Figure 2. MULTIPLE GOAL DISTRIBUTION

amenity content of public housing. This attitude is embedded in the role of government as a distributor of housing packages stamped: "To the Poor - Financed by the U.S. Government - Handle with Economy."

When housing is viewed as a social instrument by which the government attempts to respond to the social needs of the urban poor, a new housing goal becomes immediately apparent. The operational limits of social needs suggests a more dynamic stimulus or compensatory goal. The configuration of social needs involves not only quantitative deficits but also the effects of deficit living and the damage wrought by the forces which cause and sustain those deficits. This concern has been central to current educational theory and research. In meeting the needs of the Negro child in the racial ghetto, educational goals, techniques and teaching attitudes have been drastically revised to counteract the forces which disadvantage the Negro child rather than the end product, the disadvantaged child. The compatibility between the social needs for housing and for education would indicate that the strategy for meeting educational needs is equally appropriate to housing and to the stimulus/compensatory goal.

The stimulus goal complements, does not replace, other goals. Indeed, the relevant issue is the recognition that any one, single, goal will be incongruent with the number and variety of housing

needs and, equally important, with the capability of technological and economic resources to satisfy those needs. Past experience of public housing has demonstrated the fatal error of the single minimum standard. The effect of rigidly establishing the housing goal of amenity is to contribute to the perpetuation of housing which does not meet the goal of shelter, and often not even that of health. That the single goal structure of housing tends to be conceptually arbitrary and socially self-defeating cannot be ignored. Figure 2 schematically indicates how a set of differentiated goals could be applied to the programming of housing efforts. If housing is to be considered as a social instrument interacting and complementing parallel efforts in economic opportunity, education, welfare etc.,it will have to assume the responsibilities of interaction. The definition of variable housing goals consistent with variable needs is the prerequisite for the allocation of resources in an environment of competing demands.

C. Analogies for Multiple Housing Goals

As part of his adaptive mode of life man initially developed shelter to protect and extend his climatic viability. The benefits of shelter have been further extended so as to promote hygienic, familial, commercial and social viability. As the need for these extensions became evident they were, in their turn, incorporated

into public housing goals. It has been suggested that the effort to increase the social impact of public housing with the goal of amenity be amplified to include a compensatory/stimulus goal (Figures 1 & 2). Amplification of housing goals, however, satisfies only an initial phase of response to the urban poor. The completion of that response demands varied configurations of these goals as they are mobilized against variable deficits. Figure 2 schematizes one such configuration. Several analogies from biology and psychology are offered below to support the validity of this approach.

A nutriment is defined as that substance whose intake and use sustains life: promoting growth, replacing loss and providing energy. As such, housing may reasonably be considered as much a nutriment to the human diet as food; consequently it may prove fruitful to evaluate the creation, use and displacement of housing through analogies from the comestible diet.

Rene Dubos in his book, Man Adapting[1], points out man's remarkable capability to adapt to varied environments and the diets which they provide. Even within a single environment the goal of proper nutrition can be approached via many different avenues. Primitive tribes sometimes must adapt to drastically divergent diets from season to season in order to survive. They usually do so quite competently, inevitably experiencing, however, alimentary disturbances as they shift from one diet to another. The analogy suggests that

the provision of housing must respond to varied environmental demands, and that where this response involves changes in existing conditions, no matter how appropriate, some temporary disturbance will result.

Improper nutrition manifests itself in three categories: undernutrition, where there is a deficit in the diet; malnutrition, where there is not necessarily a deficit at hand, but rather an imbalance in the intake; and overnutrition, where an intake that provokes a maximum growth rate precludes the possibility of an optimum rate of growth. In order to move from undernutrition in public housing to beneficial nutrition a new intake is required which will initially compensate for past deficits (in dietary terms, a vitamin pill) and go on to insure the maintenance of nutriments which will promote growth, replace loss and provide energy for life in the urban situation. A proper diet, however, is a function of the nature and demands of the environment. Parameters concerning approaches toward the compensatory/stimulus goal must account for the varied situations of urban poorness and then establish housing diets for each situation. The analogy from malnutrition, in terms of the urban poor, supports the suggestion for programs which counteract conditions of housing imbalance, rather than deficit, with respect to other resources (health, education, employment, etc.).

Overnutrition diminishes the ability of an organism to respond to its surroundings; moreover the need for interaction is equally diminished. The disparity between the malnutrition and undernutrition of the ghetto and the relative overnutrition of the nation-at-large has been a source of division after this fashion.

A culture medium which enables and encourages, indeed induces, interaction among its occupants must precede any elimination of the ghetto's deficiencies and the perforation of its boundaries. A striking model for such an environment exists in realm of biology, as explained by Rene Dubos in Man Adapting:

> There are throughout the living world countless types of symbiotic associations, in which both partners derive advantage from their nutritional complimentariness and often require each other's presence to complete their development.....
>
> Under ordinary conditions of culture, the alga and the fungus either develop independently side by side without uniting to form a lichen, or more commonly one acts as a parasite for the other and destroys it.
>
> The first step in true lichen synthesis in the laboratory was recently acheived by the simple artifice of using a culture medium so dificient nutritionally that neither the alga nor the fungus could develop on it. When the two organisms were placed side by side on this deficient medium, association took place between them and resulted in lichen development. Restating this finding in teleological terms, the lichen is formed when its two constituents need to become associated in order to develop.[2]

In human terms the deficiencies which would demand a symbiotic association between the urban poor and the urban non-poor need not

be created in order to encourage symbiosis; these deficiencies exist today throughout the urban housing process. What must be created, however, is a realization of this deficiency on the part of the white majority: that so long as the constituents of one society are divorced from each other the viability of that society is threatened.

In contrast to the spontaneous interaction of non-conscious unicellular organisms in the face of a nutrition deficit, the program of public housing is a highly conscious infusion of nutriments from one group of human beings to another. The process of nutrition transmission must recognize the mutual benefits of interaction between the transmitter and the receptor in order that it does not degenerate into a grudging charity on the one hand or self-destructive dependency on the other. Dr. Bruno Bettleheim's work with autistic children[3] testifies quite clearly to the thesis that the value of a nutriment lies not only in its substance but equally in the manner in which this substance reaches the recipient. The nursling must not only be permitted by the mother to take the breast, he must also be encouraged in his activity by an effort on the mother's part. The confidence with which the mother approaches the infant is often translated into confidence on the infant's part as he in turn approaches the mother.

Dr. Bettleheim's work suggests that the need for action in a context of mutuality is central to the nutritional process. This mutual context, in which the nutriment substance flows in one direction but the interaction of both parties party sustains and encourages each other, aids in creating a crucial sense of causality: that one's actions, irrespective of one's status, somehow make a difference in the world.

III. URBAN POOR

A. User Typology

Any attempt, no matter how brief, to scan the dimensions of urban poorness must concern itself firstly with that condition's composition; it must then eventually seek out the boundaries of that condition. The facets, however, which internally define the urban poor and ultimately separate them from larger society are characterized by an opacity which precludes any facile classification.

That the ethnic immigrant ghetto of the United States has been traditionally considered a resource, while the Negro ghetto has become a liability both internally and externally, is a measure of the density of the present situation. Although the nation has long since become aware of the diversity which characterizes its ethnic sectors even while these sectors remain within their traditions, it has not displayed the ability nor the tendency to recognize the differentiation within the larger condition of the Negro ghetto and deal with these differences accordingly. Comprehension of the ghetto's internal diversity is a vital prerequisite for developing an appreciation of the present situation. Beyond the composition of the interior realm are the equally important facets of that realm which join it to the larger society. It is also at these interfaces that the ghetto must

be understood.

One approach towards a comprehension of the Negro ghetto's internal differentiation has been made by John R. Seeley (see Table 1).[4] The difference between necessity and opportunity and the difference between permanence and change have been utilized to develop a useful typology of slum dwellers.

Types and Subtypes of Slum-Dwellers:

Likeliest term of involvement	Primary reason for slum involvement	
	Necessity	Opportunity
Permanent	1. a. The indolent b. The "adjusted" poor c. Social outcasts	3. a. Fugitives b. Unfindables c. "Models" d. "Sporting Crowd"
Temporary	2. a. The respectable poor b. The "trapped"	4. a. Beginners b. "Climbers" c. "Entrepreneurs"

Table 1.

The slum for many of its residents is a condition thrust upon them by necessity; others see their residence there as an opportunity for activities denied to them elsewhere. Some residents in both of the above categories regard themselves as temporary residents; these are called by Seeley "temporary necessitarians" and "temporary opportunists". Others regard themselves as permanent residents; these are referred to as "permanent necessitarians" and "permanent opportunists." The affirmative aspects of change and hope are implied in this diversity by the terms temporary and opportunity.

The clarification of areas of differing deficiency within the Negro ghetto is an indispensable tool in the development of proper resource allocation. The variations implicit within the condition of urban poorness suggest the preparation of a variety of responses, combining the resources of housing, social services, education, enterprise, et al. The value of such a classification lies in the recognition of those areas of deficiency which would be susceptible to a housing solution as opposed to other areas wherein housing problems have a secondary or tertiary priority.

B. The Ghetto: Mechanism or Container?

The opacity which has historically characterized the interface between the racial ghetto and society-at-large might be better appreciated when viewed in relation to the ethnic immigrant ghetto. The ethnic ghetto provided a staging area for acculturation. The transi-

tion from Old World language, customs and habits was initiated in their neighborhoods even at the same time that a cultural continuity was preserved. The benefits of Americanization were accrued by the first generation of children. They used the ghetto as a base of operations for entry into the society of the New World. As the ghetto evolved eventually the option to leave became open; the value of this option, even to those who preferred to remain in the tradition of the ghetto, was not lost on the immigrants nor on their children. This option meant increased social viability; even if it was not utilized it was still a source of pride and security. Those who remained within were nonetheless unified and reassured by the potential open to them; those who propelled themselves into the stream of American social life realized the potency of the ghetto as a mechanism. This is the dynamic model of the ghetto.

The Negro ghetto has failed to operate in the same dynamic fashion. The United States has in the main refused to provide to the Negro ghetto the same options that were available to the ethnic ghetto. In nutritional terms the larger environment has caused severe deficiencies in the diet of one of its resident organisms. Rather than foster a symbiotic relationship between parts of society it has caused one sector to suffer from overnutrition while another has degenerated into an involuntary parasitism dangerous both to its own identity and to the larger society.

Aside from the army, the jails and the welfare rolls many Negroes do not, indeed cannot participate in the world outside. "The lack of effective participation of the poor in the major institutions of the larger society is one of the crucial characteristics of the sub-culture of poverty" (Oscar Lewis).[5] This sub-culture, tends to perpetuate itself in isolation as a form of self-protection. Many sub-cultural values are thus inherited, resulting in even lower desire for assimilation by the inhabitant and decreased probability of acceptance by the larger society.

While de jure standards proclaim the social and geographical mobility of all citizens, de facto standards impose a ghetto-status upon most Negroes, regardless of social or geographic location. The relative lack of options diminishes social viability and directly begins to affect the identity of the Negro. It is this aspect which contributes to the profound deprivation of the ghetto. The sub-cultural creation is a response to these insufficient options; by ignoring the larger society the excluded group attempts to preserve a minimum of identity. The results are often destructive: "....the poverty of culture is one of the crucial aspects of the culture of poverty." (Lewis).[6]

The Negro ghetto occupies a position diametric to that of the traditional ethnic ghetto. Where the latter was a mechanism for initiating entry into the larger society the racial ghetto has become

a container, from which outward movement into the world at large is minimal. It is these dense boundaries which must be pierced.

C. New Dynamics

Not all residents of the ghetto are members of the sub-culture of poverty. A large majority are quite attuned to the values of American society and are attempting, or would like to attempt, to engage the opportunities of that world. It is this reality which emphasizes the destructive capacity of the ghetto-as-container.

The new dynamism needed in the ghetto would reverse this tendency by recognizing that the varied positions and capabilities of the ghetto residents calls for a varied response by society. Poorness exists on many levels; the resources at hand ought to be wielded so as to address the particular deficit of the individual family. This deficit may be in the basic necessities of life or it may extend into the realms of shelter, employment or education. John Turner in his work on Peru has suggested certain contours that characterize the terrain of deficiency.[7] He points out that two families living side by side in a Peruvian slum are ostensibly equivalent in their poverty. Yet one family of day-laborers is much less concerned about their squalid living conditions than about the probability of the next day's work and food. Theirs is an employment problem. The second family has already solidified their employment and now look forward to moving from their hovel into a dwelling more appropriate to their stable,

optimistic prospects. Theirs is a housing problem. Most families face one problem at a time along a hierarchy of concerns. Meeting and overcoming each problem in its turn is of crucial importance to familial morale and stability.

The variations within a typology of "slum-dwellers" (Table 1) suggest that certain groups (permanent necessitarians) may be more in need of educational or health services than a change in housing status, whereas those who have stabilized their employment status (temporary necessitarians) may be more susceptible to a change in housing status consonant with their generally optimistic outlook. The group referred to as temporary opportunists is potentially the most mobile; they could be propelled from the threshold of the ghetto through an emphatic application of educational and entrepreneurial resources.

Implicit in the program of varied response toward varied shelter problems is the realization that the poor constitute a differentiated group. The poor can no longer be dealt with en masse. As a group they are statistically united by the deficiencies and deprivations which separate them from a viable social life; as individuals their "poorness" manifests itself across a varied spectrum of problems.

IV. SOCIAL NEEDS

A. Unsystematic Systems

It is intrinsic to the complex and manifold nature of social needs that this subject be first approached in the context of large scale systems. Although social systems cannot deal completely with anything, they tend to affect and be affected by everything, frequently in a decisive manner. In this respect they are similar to economic systems. Unlike economic systems, however, which have acquired the techniques and sophisticated models to manipulate a large number of variables, social systems suffer from a lack of conceptual frameworks. The basic assumption on which the analysis and formulation of social systems proceed is contained in Raymond A. Bauer's statement: "For many of the important topics on which social critics blithely pass judgement, and on which policies are made, there are no yardsticks by which to know if things are getting better or worse."[8]

Understandably, the advanced and powerful models of economic systems have exercised the dominating influence on the development of social systems. Since it is easier to reproduce and literally transfer than to creatively adapt, this influence is not without hazardous consequences. Many of these hazards converge in the "new Philistinism"[9]--an approach to life based on the principle of using monetary units as the common denominator of all that is

important in human life. The effects of this approach are particularly significant, beginning with the corruption of the fundamental cost/benefit device. Benefits which cannot be measured and expressed in dollars and cents are not recognized. In designing social programs great dependence is placed on the now comfortable concepts established during the **Depression.** However, the most insidious effect of the "new Philistinism" is its premise that there should be "a single-valued, objective welfare function" by which alternate policies and programs **can be evaluated.** In housing, as noted earlier in section II b, this precept manifests itself in the single housing goal of amenity and constitutes a major deterrent in engaging the housing needs of the urban poor.

Using the model of economics as a point of departure but integrating man resources and the qualitative variables, Bertram M. Gross has undertaken a comprehensive approach to social systems. His model of a system in environment, shown in Fig. 3, is a basic building block. The model is generated by four kinds of boundary crossing activities described as entries and exits, multiple membership, resource exchange and influence. Entries into informal groups are determined by acceptance and into formal organizations by recruitment, joining and promotion. Resource exchange involves the acquisition of goods, services, or information (inputs) and their processing through a clientele network into outputs. Influence consists of the reciprocal (but often unbalanced) relations

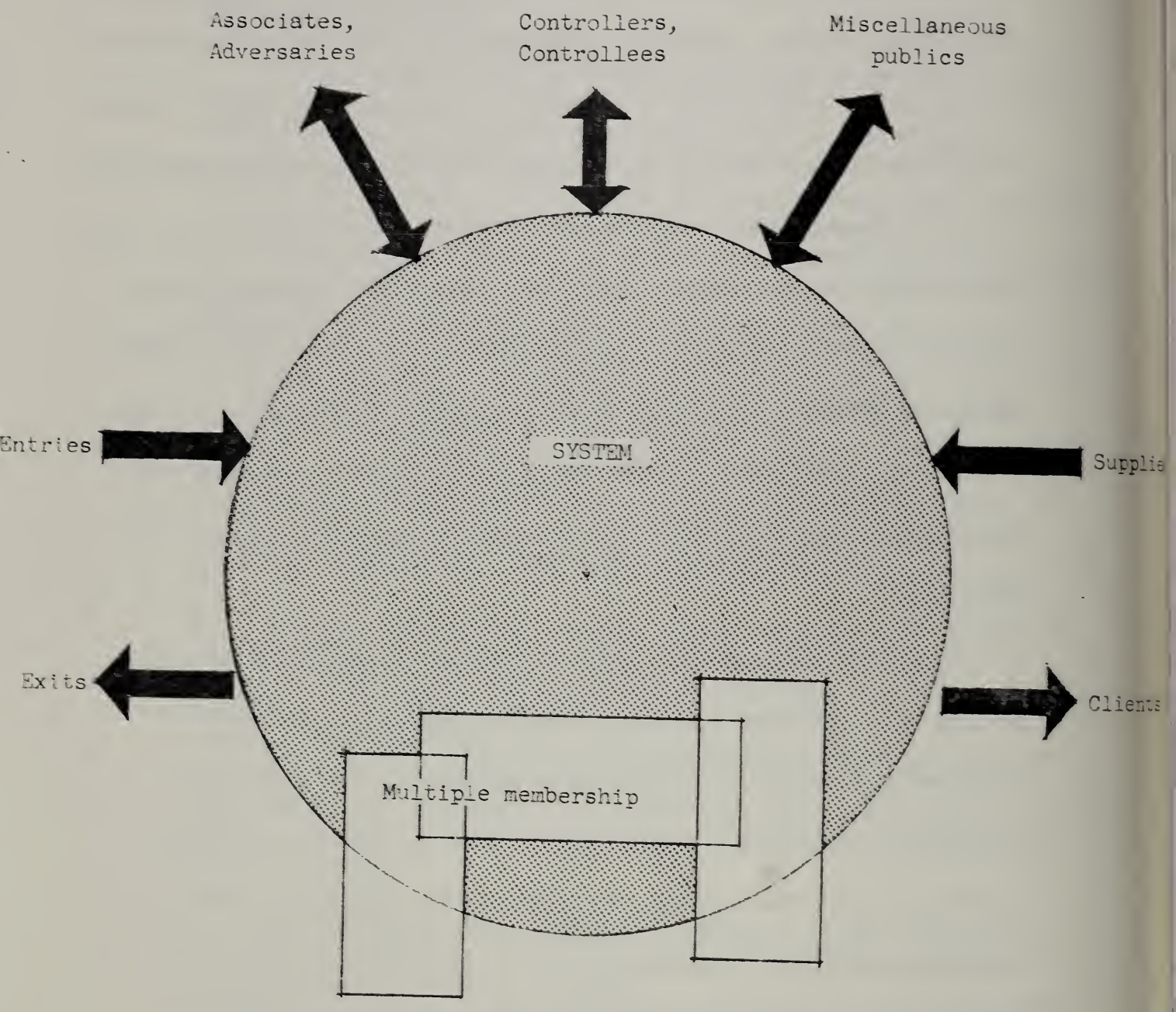


Figure 3. SYSTEM IN ENVIRONMENT.[10]

that take place with associates-adversaries, controllers-controllees, miscellaneous publics, as well as the suppliers-clients who perform the resource exchange activity. Multiple membership represents a major resource for the formation of linkages. Although conflicts and **divided** loyalties emerge, multiple roles are instrumental in making the members of one group more appreciative of the values and objectives of other groups. The boundary crossing activity of multiple membership, therefore, performs a socially educative and equilibrating function.

A social system is an open system. When it is not open, as in the racial ghetto, it ceases to be a system and becomes something else--a container. The boundery crossing activities indicated in the system model are directly applicable to the conditions of the urban poor. The restrictions on entry and movement, particularly vertical mobility, are notorious. Segregation of membership in **organizations** aggravates the inherent role conflicts of multiple affiliation and, more critically, deters formation of the linkages so necessary to social systems. Influence and power relations, which are a measure of the influence of a system's range of operations, are drastically unbalanced to the disfavor of the Negro. Finally, inadequate participation in resource exchange becomes the overt result of the impediments to the other three boundary crossing activities.

B. The Racial Experiment

Since the resolution by the Emancipation Proclamation of the political experiment of racial slavery, the United States has been conducting a large scale social experiment. The subject of the social experiment is the same racial group, the Negroes, and the issue is once again one of equality--social equality. The procedure of this experiment has been characterized by a juxtaposition of the rights and prerogatives of a de jure status and those of a de facto status. The set of ethical political principles descriptive of American democracy were considered as a de jure constant while social action and attitudes were manipulated as de facto variables. The various situations and fields in which the de facto/de jure gap developed were explored as well as the dimensions of the gap itself. Location and structure of the experiment were multiple, ranging from the intensive conditions of the ghetto laboratory, to the extensive regions of an impoverished South, as well as to the typical and neo-typical middle class environments.

The experiment was also complicated by frequent subversions in which there was retrogression from the de jure constant of political equality to a de facto reality of political inequality. Second order consequences regarding the effect of the gaps themselves on the racial group were largely ignored. The majority of observers among the population of the United States assumed a remote station

curiously resembling that of a de jure observer more than that of a participant observer. This attitude of detachment on the part of those outside the ghetto fostered the "paternalistic dole" character of the experiment.

Resistance to the rationing of opportunities and rewards, symbolized by Martin Luther King's Washington March in 1963, became widespread. In 1964, articulation of this resistance was summarized in Whitney M. Young's book, To Be Equal, in which he documented the historical inconsistencies of avowed democratic principles with their dramatically oppressive effects on the Negroes. A racial experiment, Young pointed out, that at best is permeated by subtle and not so subtle social injustices and at worst is simply and profoundly inhuman, is invalid and must be rejected.

The particulars of social oppression were evident in the statistics of want, disease, ignorance, squalor and idleness. The gruesome effect of social rationing on the Negroes is particularly striking when the statistics of deprivation are indicated with reference to the white racial group. In one out of every four Negro homes, the worker is unemployed (compared to one out of twenty for the white, **a ratio of 5:1).** One million Negro youths are idle (a ratio of 3:1 to the white) one out of six Negro owned homes is dilapidated and inadequate (a ratio of 5:1) the death rate at infancy

for Negroes is twice that of the white. One out of ten Negro workers is illiterate (a ratio to the white of 4:1). In education the Negro received an average of 3½ years less schooling than the white, and when adjustments are made for differences in quality the gap increased to 5 or 6 years.[11] These grim facts, which are a small sample of Negro deprivation, clearly call for a special remedial effort. Young concluded by outlining the type of understanding and specific programs that would be necessary to first arrest the overwhelming tide of deprivation and then to initiate a recovery.

In the summer of 1967, the social experiment of rationing produced a violent reaction of literally incendiary proportions that spread through the cities of the United States, spelling out a clear and urgent message. The experiment was out of control. A Presidential commission was immediately appointed to investigate what happened in the ghetto laboratories and to make "in depth" recommendations. Eight months and 700 pages later, the Commission confirmed what Negro leaders had unsuccessfully tried to explain for years. The social experiment was officially abandoned.

C. Interpretations

After formulating a reasonably thorough description of the urban poor Negro, it becomes apparent that the description is in effect also a description of his tangible social needs. The racial ghetto is the focus of social concern and alarm precisely because the

deprivations of its inhabitants can be measured in their lack of employment, opportunity, education, health, etc. In systems terminology, their crucial poorness, and therefore their crucial social needs, derives from the inability of the racial ghetto to function as a mechanism rather than as a container. When the boundary crossing social systems are artificially constrained, the consequent poverty and concomitant social needs become accessibility (entry and multiple membership), availability (resource exchange), and action (influence) in measures of adequacy. Kenneth Clark prefaces his definitive work, The Dark Ghetto, by stressing the distinction between the empirical facts of the ghetto and the truth of the ghetto which can be obtained only through an interpretation of those facts. If any justification were necessary for diverting prior and exclusive attention from the larger category of the urban poor to the urban Negro, as this report has done, it would be offerred on the issue surrounding the misunderstanding of the racial ghetto. The fallacious analogy between the classic ethnic ghetto and the racial ghetto cannot be written off as a mere inaccuracy. The pressures on the Negro in the ghetto are compounded by the double burden which is placed upon him. He is projected into an environment of incredibly difficult circumstances, contained within rigidly defined limits, and then subjected to destructively negative evaluations of himself and his environment. The ghetto

legend speciously tells him that a ghetto is a mechanism with all the generative attributes of a mechanism. Ignoring the difference between the inert container and the active mechanism, it tells him that he should be able to accomplish through the racial ghetto what has been achcived in the old ethnic ghettos. In the cruelest of all ironies he is, therefore, deprived of the recognition due him for his heroic struggle against **unequal odds.**

The inevitable consequences are described by Clark. "Human beings who are forced to live under ghetto conditions and whose daily experience tells them that almost nowhere are they respected and granted the ordinary dignity and courtesy accorded to others will, as a matter of course, begin to doubt their own worth. Since every human being depends upon his cumulative experiences with others for clues as to how he should view and value himself, children who are constantly rejected understandably begin to question and doubt whether they, their family, and their group really deserve no more respect from the larger society than they receive. These doubts became the seeds of a pernicious self and group-hatred, the Negro's complex and debiliating prejudice against himself."[12]

The internalized personal situation of the Negro was damaged by the effects of social rationing that Clark describes. Similar effects take place on the larger societal front. Here the overt conditions are more visible, making the relative aspects of depri-

vation more glaring. In his eloquent Washington March address, Martin Luther King said "the Negro lives on a lonely island of poverty in the midst of a vast ocean of material prosperity...and finds himself an exile in his own land." Years later in the midst of violence and disorder, this same theme is echoed by a frustrated young Negro who cries out: "What whitey don't understand is that America is a damn rich country and she flashes this richness in the brother's face and tells him, 'it aint for you'."[13]

The underlying rationale supporting these statements is now better understood and accepted. However, the conceptual problem of distinguishing between the social needs relevant to the racial experiment while it was in progress and the needs for the post-experiment period remains. In the psychological phenomenon technically known as "goal gradient" and popularly known as "running home," subjects approaching the final goal of an experiment typically gain a second wind, speed up their performance, and increase their demands. Pettigrew in his Profile of the American Negro characterizes the need of the post-experimental period as one in which "the basic problem becomes one of not merely allowing Negroes to enter the mainstream of American life but of enabling them to enter."[14]

D. Identity

The preceeding discussion attempted to outline the background of social needs as the result of the interaction of an intricate

network of social systems. In viewing the racial ghetto as the subject of an invalid social experiment, the well known and publicized hard data of social needs were recorded. A more cohesive understanding of the **reality or truth of the racial ghetto was** approached by the interpretation of these data in terms of its causes and pathology. Despite the abundance of well defined needs that this type of analysis reveals, it appears useful to extend the examination to the roots.

Whether the social dynamism that has been generated by the Negro movements represents an accellerated evolution or a revolution, is a matter of scientific distinction. What is of more importance is that the movement is both dependent upon and evidence of a revolution of awareness. This suggests that the pattern of forces and actions forming the spectrum of social needs has a point of convergence in an elemental social need. We would like to consider that elemental need as the need for identity. Few are the surveys and studies of the Negro confined to the ghetto which do not include descriptive references to identity. With the dominant importance that it is given here, the term is used in a more generative sense. Robert Penn Warren employed it in this sense when he dramatically exclaimed:

> I seize the word identity. It is a key word. You hear it over and over again. On this word will focus, around this word will coagulate, a dozen issues, shifting, shading into each other.

> Alienated from the world to which he is born and from the country of which he is a citizen, yet surrounded by the successful values of that world, and country, how can the Negro define himself? There is the extreme act of withdrawing as completely as possible from that white world. There is the other extreme of 'self-hatred,' of repudiating the self and one's group. Clearly, neither extreme offers a happy solution. Yet there is no simple solution of half-and-half, for the soul doesn't operate with that arithmetical tidiness.[15]

The concern of science with identity can be traced back to Freud, who introduced the concept of contrasting negative and positive identity. The two poles exist in a state of tension dependent upon the degree of freedom (positive) or restriction (negative) which the environment creates. From these observations the relative character of identity and the susceptibility of a minority group's identity being dominated by a compact majority began to be understood. For Negro writers the concept of negative identity occupies a central role in their art and perception as well as for a collective recovery. When Ralph Ellison speaks of "a voice of faceless faces, of soundless voices lying outside history,"[16] he is describing a common theme.

During the past twenty years, the study of this elusive subject has been appreciably clarified. Erik Erikson in his book, Identity, Youth and Crisis, deals with a "process located in the core of the individual and yet also in the core of his communal culture." It is a process of increasing differentiation which takes place between

the psychological and social, the developmental and historical, and which he finally conceptualizes as "a kind of psychosocial relativity." In describing the complexity of identity Erickson offers the following word sketch:

> Identity formation employs a process of simultaneous reflection and observation, a process taking place on all levels of mental functioning, by which the individual judges himself in the light of what he perceives to be the way in which others judge him in comparison to themselves and to a typology significant to them; while he judges their way of judging him in the light of how he perceives himself in comparison to them and to types that have become relevant to him. This process is, luckily, and necessarily, for the most part unconscious except where inner conditions and outer circumstances combine to aggravate a painful, or elated, 'identity-consciousness'." [17]

The dimensions of the identity crisis far exceed the outer boundaries of a crisis of alienation. When Negro writers deal with negative identity they are concerned with more than the analysis and description of adjustive behavior as a response to the restrictions of a white majority. Their artistic achievement must be understood in terms of their insights into the tension between the elements of positive and negative identity that takes place within the Negro personality and within the Negro community.

The necessarily different connotations that Erikson employs in his investigation of identity are summarized as follows:

1. a conscious striving of individual uniqueness
2. an unconscious striving for a continuity of experience

3. a solidarity with a group's ideals.[18]

Evident in this composite of meanings is the fundamental role of past and future related to the individual and society. It is through time's complementary nature that identity "links the actuality of living past with that of a living future." This sensitivity to a changing social reality makes identity particularly significant to the formulation of social needs into a performance standard. Indeed, it is indispensable.

Schematically, the identity process may be externally viewed in terms of the boundary crossing characteristics of social systems. This perspective requires that the related but more passive variable, security need, be considered as a constant. The function of security in the process is that of a filter in which the perforations of the mesh determine the amount and type of flow. Identity formation is indirectly affected by security to the degree that it facilitates or constrains movement. It does not, however, receive positive inputs from security. The success or failure of this movement in crossing social boundaries directly affects identity. Entrance into the larger societal system results in positive identity input; failure to enter results in negative input. Negative identity input also occurs where security factors constrain movement outward. In very simplified form Figure 4 indicates these relationships.

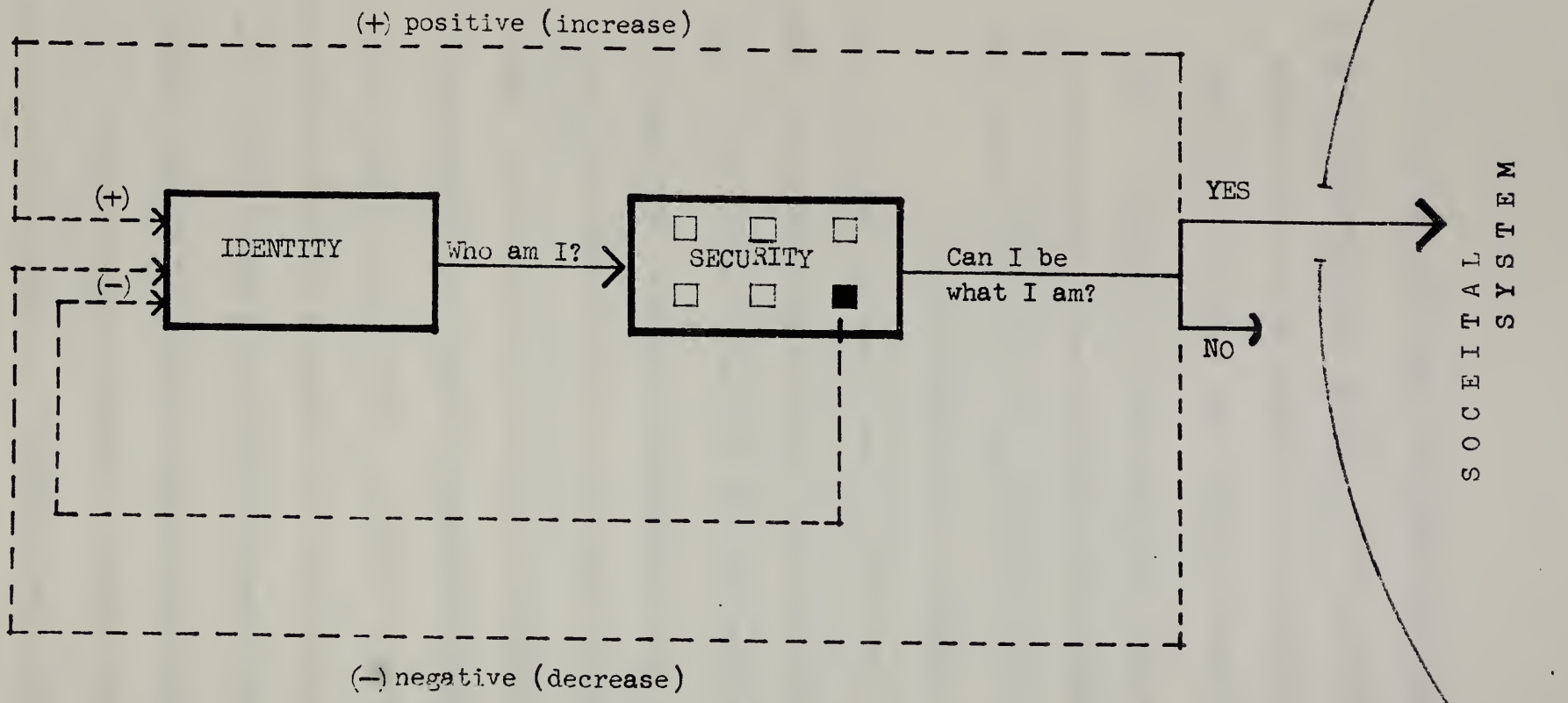
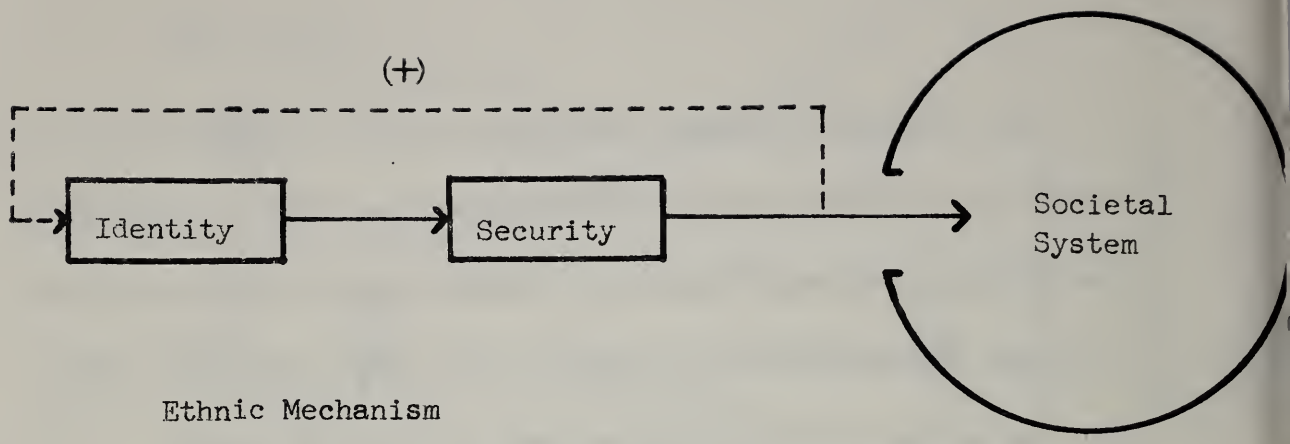
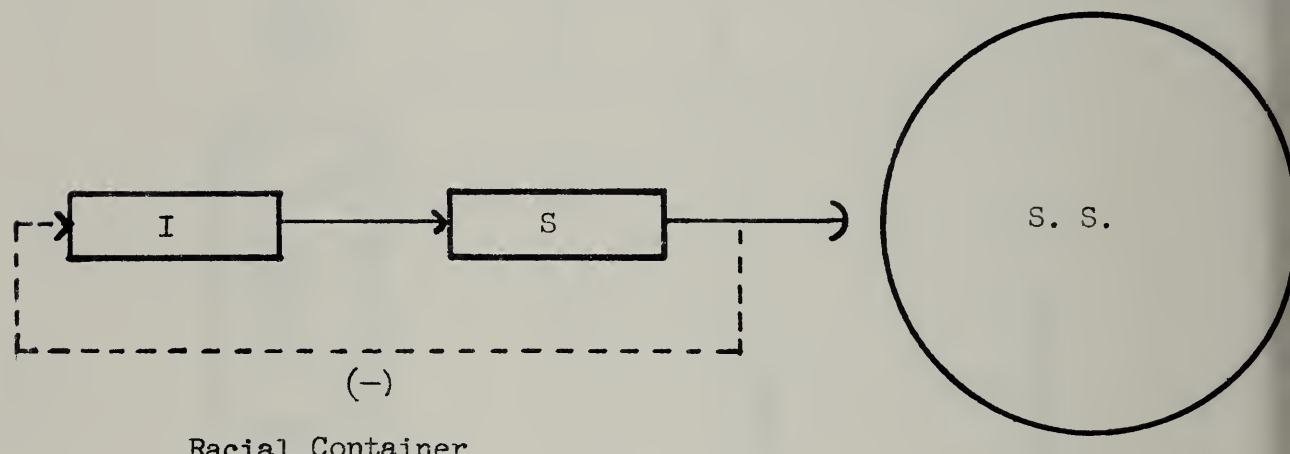


Figure 4. IDENTITY-BUILDING PROCESS

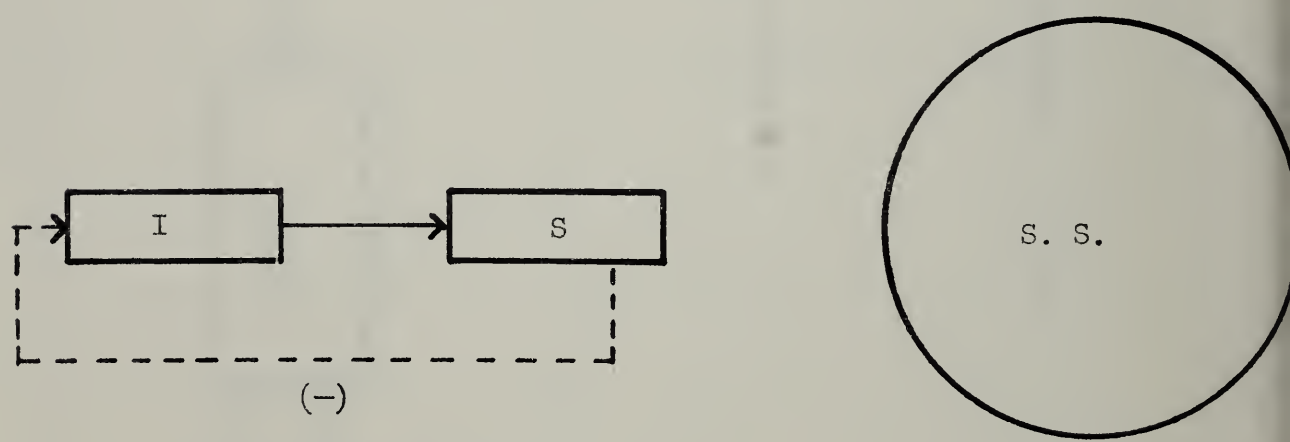
The concepts of ethnic mechanism, racial container and sub-culture of poverty are also presented schematically in terms of the identity process (Figure 5), showing the relative positions of these sub-systems with regard to the larger societal system and the effect of their dispositions on identity inputs.



Ethnic Mechanism



Racial Container



Culture of Poverty

Figure 5. VARIATIONS OF IDENTITY-BUILDING PROCESS

V. SOUL: A PERFORMANCE TEST FOR HOUSING

A. Urban Blues

As the scope of need moves from the experimental phase of "allowing" to the responsive phase of "enabling," a more difficult challenge is presented. This challenge arises out of the demands of an active campaign to broaden the opportunities of the urban poor Negro, and requires new strategies for its new purposes. The multi-faceted root need of identity has been offered as the point of reference around which social needs orbit.

Identity formation, it is recalled, is characterized as a process involving simultaneous individual-group development taking place in the historical time of a living past. Within the Negro ghetto response to the identity process is dominated by the concept of soul: the soul ideology or the soul movement. Evidence of a new and more complex challenge is contained in this statement of the soul strategy: "Let us fight for our rights, not because it is a disgrace for a democratic society to include twenty million second-class citizens, but because we value our cultural identity and wish to be able to develop it and express it without fearing punishment from the white majority."[19] Because it is so indispensable to the Negro's view of himself, soul must be both the vehicle by which the process of identity formation is carried out, and the test of its success.

If today there is a reasonable degree of awareness of the conditions of the poor in the racial ghetto, it is primarily due to the Negro protest movement. Its exclusive objective was to confront the combined attitudes of resistance, indifference and complacency held by the white majority and to force them to abandon the racial experiment of social rationing. The limited options available to this movement did not afford the luxury of an educational venture. The brutal facts of the ghettoized Negro had to be mobilized without the entourage of those multiple perspectives which would have produced a balanced view but which could have also diverted attention from the basic issue. With the exception of the protest movement and Negro artists, it is not surprising then, that preoccupation with the Negro's psychological maladjustment, social disorganization and cultural deprivation on the part of the majority of onlookers has obscured the presence of resources and vitality which have survived the destructive forces of the ghetto.

The soul movement, turning old liabilities into new assets, attempts to affirm its own traditional values in response to new conflicts and objectives.

Much of what is evoked by the soul movement is distilled in the most popular form of soul music, the blues. Charles Keil, a working jazzman trained in sociology, anthropology, and musicology, offers an insight into soul strategy by a comparative analysis of rural and

urban blues. In the country, a bluesman sings to ease his worried mind, to get things out of his system, to feel better. His style is spontaneous, uncritical, and personal. It is the style appropriate to individual catharsis. In contrast, the urban blues is more homogeneous in style and directed toward group solidarity in both lyrics and performance. The urban blues man senses a broader and deeper obligation to the Negro community. In the bewildering urban situation characterized by shifting values and interpersonal conflicts, people expect more than a personal lament.[20] The urban blues must not only provide a graphic description of the problems surrounding the man in the ghetto, it must also involve their analysis and solution.

Throughout the various phases of its evolution, the emotional element in the blues has remained constant. With the appearance of the urban blues, the blues tradition has acquired an evaluative aspect of great significance to the concept of group identity. Purvis Spann, a Chicago blues disc jockey, frequently tells his listeners, "If you don't like blues, you've got a hole in your soul"--that is, you are neither a real Negro nor a complete person.

B. Tell It Like It Is

Although the word soul is not dialectical in the sense that there is no appositional word like no-soul, it functions in sets of opposites. Soul attempts to reconcile the bitter-sweet, joyful-sad,

pain-pleasure toward a higher synthesis: brotherhood. Keil has defined soul as being "a mixture of ethnic essence, purity, sincerity, conviction, credibility and just plain effort." Reduced to a single criterion, soul must have commitment. In describing the prerequisites of a blues or soul singer, bluesman Al Hibbler also describes the essentials for soul. The credentials he lists for being a bluesman are "being hurt by a woman, being brought up in that old time religion, and knowing what that slavery shit is all about."

No source is more valuable for the appreciation of the components of soul than the grass roots of the Negro community. Working from a script prepared by Keil on the topic: "What is Soul?, How is it defined?, Who has it?", Hotline, a public opionion program on radio station WVON in Chicago, invited listerners to express their views. Together with the results of his interviews with blues singers and observations at blues rituals, Keil recorded a composite list of views on soul:

. . . . . **The hearin'**, the feelin', the tastin', I believe that all goes to make up the soul . . . . . Whenever I hear the word soul, no matter what it's related to, I have that very good feeling that here we are going to have something very fine, something pure, something that hasn't been in any way distorted . . . . . I wouldn't say that soul controls the

emotions or that the emotions control soul. I believe that they work in there together somewhere . . . .

Question to bluesman Little Jr. Parker:

What does your audience expect from you?

Jr. Parker:

They expect what you are . . . .
. . . . the blues is based on somebody's life, it hits 'em in the heart and love comes out . . . .
. . . . I go to Philips and around the school when the teenagers speak of soul, they mean put all you have into it--let's say like a musician, when he speaks of soul he means he's puttin' all he has into the music--make it sound good.

Interviewer:

Suppose he puts all he has into it and still it doesn't sound good?

Jr.:

Well, he has a lot of soul.

Interviewer:

He still has soul?

Jr.:

Right! . . . . They expect work, they does, hard work. And if you're workin' hard and enjoyin' it, they'll enjoy it too . . . .

It's me and you, I and Thou, call and response . . . . . .

. . . . . What's the word?

Thunderbird.

What's the price?

White folks' price.

Who drinks the most?

Colored folks.

Not watered down--not diluted--not dehydrated--oooohh, but the real nitty gritty, I'm talking about pure soul . . . . . .

What makes you feel so good when your baby get a evening gown
What makes you feel so good when your baby get a evening gown
Must be the same old thing what make a preacher lay his Bible down.

. . . . . If you're havin' some soul food, we havin' our greens and blackeyed peas, we havin' some soul food because we're **feeding our souls, our bodies.** . . . . . I don't want no lettuce sandwich on toast.

C. Communication

If soul feeds on truth, it is that truth which gets across, comes through. In a cultural period in which the ability to effectively communicate has become a major preoccupation, this attribute of soul represents an invaluable resource. Through its most evolved forms, music and dance, Negro life stresses aural perception, oral expression, and body movement. Soul behavior encompasses the broad spectrum of talking, joking, preaching, walking, as well as dancing and singing. In the ghetto, the literary medium of the written word plays a decidedly secondary role to the oral tradition and the spoken word.[22]

Contemporary man, through the extensions of electronic media, is exposed to and plugged into a new way of knowing. The country bluesmen, for example, are characterized by the "down-home" sound of the solo voice, unadorned guitas and story line. Bluesmen making the transition from country to city have for the most part, however, adopted electronic amplification equipment for their guitars and organs; the story line has given way, in rhythm and blues, to the beat. These modifications in blues may be seen as a response to the scale and intensity of the urban situation. The profound influence that the new, non-literate media will have on our culture and society are only now beginning to be perceived. The stagnating dependence on the literary medium has been presented by

Marshall McLuhan's Gutenberg Galaxy; further exploration into the inhibitions of print and the potential of new communicatory modes was made in Understanding Media. Non-literate forms of sensory communication have attracted the efforts of many anthropologists. E. T. Hall's observations on how man moves through and uses space has led him to suggest that there is a "silent language' of space. Edmund Carpenter's cinematic work is an effort to apply the insights of sensory research to an existing medium. The power to express, through a non-literate medium, the coexistence of such antithetical emotions as despair and hope can, as seen in the cover photographs,[23] be superior to the written word. Opposites, as has been stated, are the stuff of which soul is made. In sofar as sensory media can best express this condition, they might be collectively termed 'soul communication."

The sensory deficit or lag that characterizes our communication apparatus is sharply contrasted by the sensory variety and richness common to the Negro tradition. With the exception of a professional influence on the art forms of music and dance, and of the contribution to an expressive vernacular, this tradition has been essentially ignored. In a curious inversion, the white majority's literate but sensorily deprived culture is imposed on the minority's non-typographical but sensorily superior media. The observation that the demands of the Negro culture have fallen on deaf ears has both

literal as well as figurative connotations. The potential opportunities to be derived from a more appreciative position are implicit in Keil's suggestion that the non-machine tradition of soul may become the Negro's spiritual gift to America.[24] For anyone operationally involved with social needs of the ghetto Negro, recognition of the language of soul is imperative.

D. Decision Making

The operational requirements of soul, commitment and acceptance, are deceptively simple. These requirements, however, are mandatory. They allow no equivocation nor are they open to negotiation. Soul is a performance concept applicable to the process of identity formation: a process in which the acceptance requirement is not the end result of a conferring action but an organic part of decision making.

The emphasis on information collection and evaluation so typical of technological decision making has made the objective (factual) aspects virtually the sole criteria of a "correct" decision. The other important dimension for an effective decision, acceptance--the way persons who participate in the execution of a decision feel about it--is relegated to a secondary and sequential position. In simplified terms a formula has been proposed equating an effective decision (E.D.) to quality (Q), the objective dimension and acceptance (A), the subjective dimension.[25]

$$E.D. = Q. \times A.$$

Figure 6a indicates the priority usually given to quality. It is only after the quality requirements have been satisfied that acceptance is approached. The alternate sequence is to establish acceptance as the primary objective as shown in Figure 6b. Conflicts between the quality and acceptance aspects will inevitably occur but must be resolved by the dictates of the problem. Management methods for obtaining acceptance have evolved from dictatorial imposition, to the appeal to duty, to persuasion (buy-sell syndrome), and finally to a participatory approach.

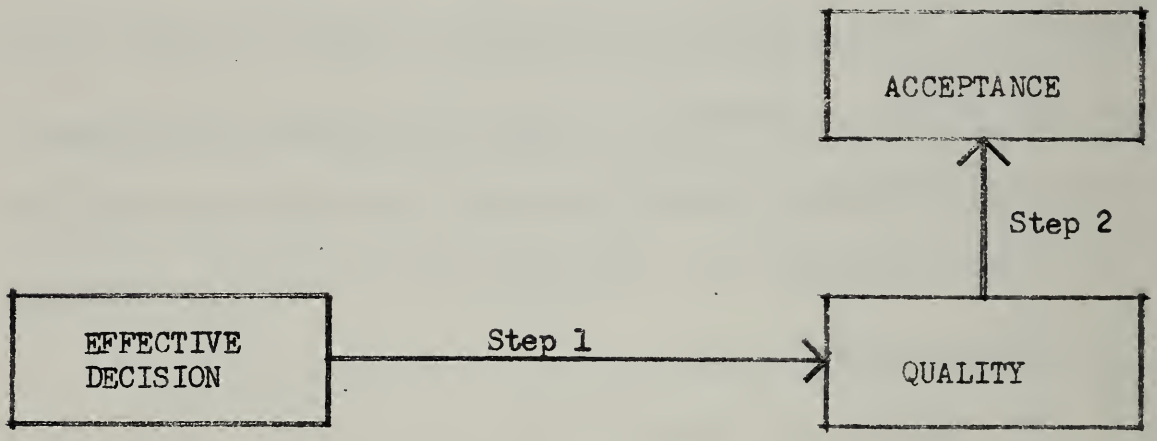


Figure 6a. TRADITIONAL METHOD

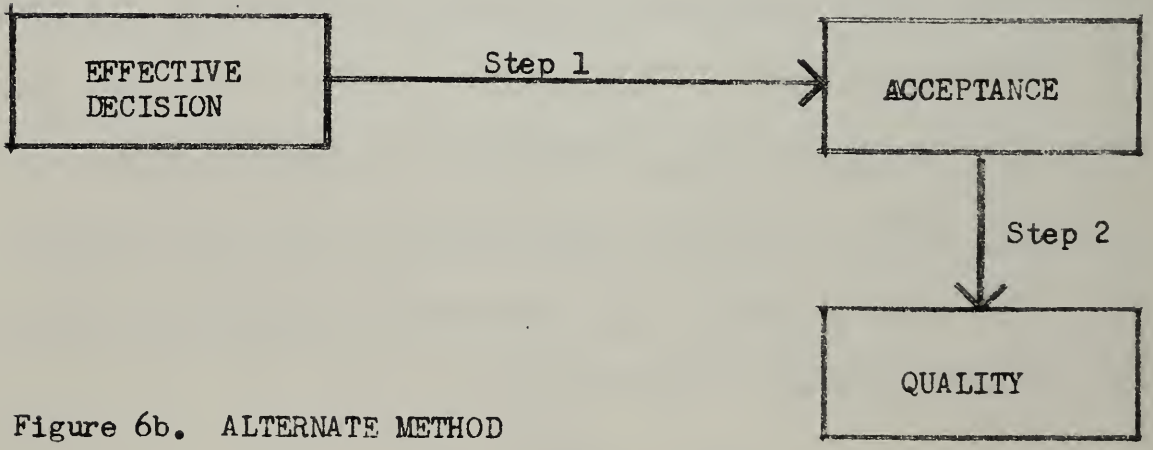


Figure 6b. ALTERNATE METHOD

The bureaucratic equivalent of soul is "maximum feasible participation." This expression made its first appearance in legislative proceedings during the development of the Economic Opportunity Act. In his book, The Politics of Poverty, John C. Donovan tells how the misunderstandings regarding the meaning of "maximum feasible participation" contributed to the controversies that accompanied its implementation. Its innovative character had been obscured by ambiguity. There was a failure to recognize that it "is not merely another method of administrative arrangement; it is a method of social action aimed at a far reaching social reform."[27] A summary analysis of its origin and objectives was expressed by Senator Robert Kennedy in his testimony to the Congressional subcommittee:

> The institutions which affect the poor--education, welfare, recreation, business, labor--are huge, complex structures, operating for outside their control. They plan programs for them, not with them. Part of the sense of helplessness and futility comes from the feeling of powerlessness to affect the operation of these organizations.....this bill calls for maximum feasible participation. This means the involvement of the poor in planning and implementing programs: giving them a real voice in their institutions."[28]

Maximum feasible participation transcends consensus and means different things in different contexts. To the poor in the racial ghetto it represents entry into social systems; a device for satisfying the social need for identity formation. For housing it represents the bureaucratic mechanism by which any housing program can hope to satisfy the performance requirements of soul.

VI. CONCLUSION

A. Summary

Throughout this report we have attempted to sustain a theme in which the urban Negro of the ghetto is recognized both collectively as a member of a group and individually in a personal role. Reference to the Negro ghetto establishes the important economic and geographic components of the social problem; its usefulness, however, is primarily diagnostic. For the purpose of applying performance requirements it is necessary to acknowledge the significant variations which exist within the group, and more importantly, the significant variations in society's realistic capacity to respond to their needs. These considerations have generated the conclusion that a compatibility between the differentiated social needs of the urban poor and performance requirements for housing be accomplished through the formulation of multiple goals.

To be poor in the Negro ghetto involves many consequences. One of the most important and least appreciated of these consequences is that the Negro is extremely sensitive of his role and of the adverse forces to which he is subjected. This sensitivity generates a complex of social and psychological adjustments whose cumulative effect is external apathy and indifference coupled with internal withdrawal. Performance requirements for housing which presume to engage this sensitive social fact must be formulated at a correspondingly fun-

damental level. We have indicated identity as the root need and introduced the concept of soul as the mechanism for acheiving it. The dynamics of soul housing call for the inclusion of the urban Negro poor as an active element in the network of housing creation. Direct involvement of the poor in housing program development and design has long been a feature of classic community action programs abroad. It has been adopted by the Peace Corps in foreign development and here in the United States its potential is being developed under certain Advocacy Planning projects, exemplified by that of Professor Robert Goodman (M.I.T. School of Architecture) in Roxbury, Massachusessetts. In this way the traditional benefits of client involvement in the housing selection and design process, previously confined to the middle and upper classes, are introduced into the public housing process.

The need for multiple housing goals, established in the body of the report and recapitulated in the first paragraph of the summary above, provides the impetus behind the objectives of the first research proposal. Its aim is to develop housing in its proper perspective with regard to the larger, cabinet-level resource system composed of housing, health, education, employment, welfare, transportation, foreign policy, etc. The force of identity formation, around which the report focused and from which the second summary

paragraph is drawn, activates the aims of the second research proposal, wherein housing is now considered as an independent system consisting of resource (H.U.D.), design professional and client (urban poor) in an interacting network. The third research proposal formulates operative aspects for acheiving the goals of the two prior proposals; specifically providing techniques, tools and procedures through which the objectives of the first and second research proposals can be realized. Collectively, then, the three proposals have been structured in terms of H.U.D.'s subsystem responsibilities (multiple goals), its system function (soul-housing), and its need to acquire the support apparatus to implement the proposed research.

B. Research Proposals

1. Research Proposal One

a. Objective: Performance classification of multiple housing goals as a function of social and non-social needs.

b. Outline : As a point of departure research could initiate from the following hypothetical goals:

(1) Social Needs = Stimulus

This goal considers housing as an active nutrient in overcoming critical defeciences in the larger social diet. Focus would be placed on those social needs and their corresponding performance requirements for housing which can contribute significantly to the total situational needs of the Negro in the ghetto.

(2) Social Needs = Amenity

Current housing goals are predicated on a suitable living environment based on amenity. This investigation would be concerned with the parameters of a housing goal in which only those social needs conventionally associated with housing are satisfied.

(3) Social Needs = 0

Housing devoid of any recognition of social needs approaches the state of pure shelter. The function of this goal is to provide a basis for an immediate response to the critical needs of shelter and health.

c. Value to H.U.D.: Performance classification of multiple housing goals enables H.U.D. to develop the housing sub-system as an element in the dialogue between area of concern, the ghetto, and the Cabinet level of resource allocation.

2. Research Proposal Two

a. Objective: The participation of the urban poor in the housing process in the role of client.

b. Outline: Proceeds from the hypothesis that the urban poor are as differentiated a group as any other and as such are in need, even more so than the middle and upper classes, of the identity making process of housing selection.

With the existing design process for individual clients as a framework, develop a model appropriate to the participation of the urban poor. The model would link in triangular fashion the client (urban poor) with the design professional with the sponsor (H.U.D.).

The participation of the poor would take place as follows:

(1) Orientation into the H.U.D. operation involving them with general background.

(2) Explanation of the housing process: the role of H.U.D. as sponsor; the role of design professional as synthesizer; the role of individuals as clients.

(3) Arrange client/professional interchange.

(4) Establish a client organization to examine and communicate felt needs of the group.

c. Value to H.U.D.: Eliminates bureaucratic obstacles; direct communication with the ghetto provides H.U.D. with constant flow of new information and feedback on previous work; provides sensitivity to information flux.

Client's sense of group solidarity with peers, communication with higher level of social system and opportunity to influence decision making in housing increases self-evaluation; creates soul quality for housing process. Social factors aside, soul housing tends to optimize client interest in and care of physical facilities.

3. Research Proposal Three

a. Objective: Develop the operational capability to implement the objectives of research proposals one and two.

b. Outline:

(1) Information exchange methods

(a) Client/professional

- furniture sub-system:
  as family resource
  as basis for design procedure.

- individual family needs.

- client organization, 2b(4), relays felt needs of group.

(b) Professional/client

- design communication media:
  graphic, typographic, cinematic, three dimensional, operational gaming.

- furniture mock-ups:
  establish needs of family space allocation

- visit new site and neighborhood

(2) Develop program; intermediate and final design

(a) formulate family needs, group needs.

(b) result of furniture survey.

(c) result of site visits.

(d) utilize varied communication media above.

(3) Develop community/housing interface

(a) community program/housing program.

(b) community facilities/housing hardware.

c. Value to H.U.D: Client involvement in decision making increases disposition to accept the final outcome, regardless of its possible shortcomings. Soul housing (Effective Decision = Acceptance x Quality).

Aid of communication techniques encourages professional/client interchange. Clearly presented, comprehensible alternatives increase client ability to participate. Participation makes positive input into client identity.

Creation of client groups, site visits and community interface eases transition from old to new.

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A PILOT STUDY
OF THE ECONOMIES OF SCALE
RELATED TO RESIDENTIAL CONSTRUCTION

For

National Bureau of Standards

United States Department of Commerce

By

NAHB Research Foundation, Inc.
627 Southlawn Lane
Rockville, Maryland

April 1968

CR - 329

INTRODUCTION

In mid-February, 1968, the NAHB Research Foundation, Inc., was contacted by the National Bureau of Standards Institute for Applied Technology to determine whether the Foundation would consider undertaking a pilot study related to the economies of scale in residential construction. The Foundation analyzed the feasibility within the time and cost restraints, submitted a proposal and received authorization to proceed with the study on March 1. The report was to be completed and submitted by April 15, 1968.

The National Bureau of Standards and the Research Foundation recognized the extreme time constraint involved in undertaking research on such a broad and complex subject. Accordingly, the work outline was limited to determination of price-quantity breakpoints for major products used in low and middle income housing; effect of volume on builders' site operations and management; determination of major building products, manufacturers' methods and criteria for determining the minimum market potential necessary to induce investment in new products; and evaluation and summarization of the information and data obtained.

In addition, the work agreement provides for the preparation of an outline of a more comprehensive program dealing with the same objectives. The outline, which has been submitted in a separate document, is designed to obtain information on a wider basis and in greater depth than contained in this report.

This study is a part of a larger effort by the National Bureau of Standards to outline a major program of research related to the development of knowledge and test methods that could be used to develop performance standards.

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SUMMARY

At the request of the National Bureau of Standards Institute for Applied Technology, the NAHB Research Foundation, Inc., undertook a pilot study of the economies of scale in residential construction. Authorization to proceed was received on March 1, 1968. The completed report was required to be submitted on April 15, 1968.

Objectives

Time and cost restraints involved in undertaking research on this broad and complex subject are severe. Accordingly, the work outlined in the agreement was limited to determination of price-quantity breakpoints for major products used in low- and middle-income housing; determination of effect of scale on builders' site operations and management; determination of major building product manufacturers' methods and criteria for determining the minimum market potential necessary to induce investment in new products; and evaluation and summarization of the data and information in the form of this report.

Method

Data and information were obtained by personal interviews with 34 builders in 18 states whose volume varied from 6 to 4910 dwelling units per year. They had varied methods of operation, various degrees of vertical integration, and they had built many different types of dwellings and related structures. Information was requested by letter from 25 major building products manufacturers, and replies were received from 18. This was supplemented by some personal discussions and by telephone interviews. Some data were extracted from the 1959 and 1964 NAHB surveys of builder membership and from a 1967 NAHB and American Marketing Association study of large volume builders.

Economies of Scale - An Overview

Consideration of subjects other than those mentioned under "Objectives" were beyond the scope of this study. However, the NAHB Research Foundation, Inc., elected to enumerate and comment on most all of the other factors pertinent to costs and the economies of scale in an effort to provide a broad and more meaningful overview of the entire subject.

Comments in relation to scale are set forth on primary costs -- raw land, land development, direct construction, indirect construction, marketing, financing, and general and administrative expenses -- and on scale related to secondary cost factors -- management, materials utilization, other labor-related items, repetition, other land-related items, location, geography, weather, codes and zoning, and government, regulations, taxes, etc.

In addition, 1959, 1964, and 1967 survey data of the percentage of builders producing various volumes of dwellings and their proportion of the total market are tabulated and evaluated. These overall builder/volume profiles and the changes from 1959 to 1964 to 1967 help to contribute to a better comprehension of the huge, complex, and varied home-building industry in relation to economies of scale.

An example of a reasonably typical cost breakdown of a single family dwelling selling in the medium price range is included to put in perspective total direct construction costs and materials costs in relation to total price.

List of Materials, Products, and Services

The report identifies a comprehensive list of materials, products, and services utilized in the construction of low- to medium-priced dwellings. Items that constitute a major portion of the total direct construction costs are also identified.

Price-Quantity Breakpoints

Price-quantity breakpoint information and data on materials and products were obtained from builders and manufacturers. Materials and product prices do vary with volume, but the determination of this variation is complicated by the existence of major factors that influence price independently of volume. Unit price variations with volume have been calculated and set forth to simplify comparison.

The distribution system has at least six primary patterns (plus many others) that affect price independently of volume.

There are a very large number of quality and specification variations for most building industry products. At least 20,000 and perhaps 100,000 different products are used in the industry, many of them similar, but with slightly different sizes, thicknesses, finish compositions, colors, textures, etc. The price of each is slightly different and varies independently of volume.

There are a number of servicing and special factors that affect material prices. The manner in which the products are delivered, stacked, wrapped, finished, precut, inventoried, handled, etc., affects price. Freight affects price. Prices of some products fluctuate almost daily, and most prices vary with the time of the year. Market conditions at a given time also affect price. All of these affect price independently of volume.

The multiple examples of specific variations of price for similar products with the same and different volume illustrate the price effect of the variables other than volume. Statements from respondents for different volumes for economic breakpoints also illustrate this effect.

Some builders establish their own materials "dealer" organization, buy in volume, and perform "distributor/dealer" services for volume purchases.

The cost of interest, purchasing, unloading, inventorying, delivering to the site, accounting, and other overhead costs for performing these services tends to offset the cost reduction of volume purchases. Purchases of substantial volume involve cost for these services which tend to offset the price advantage of volume whether the costs are incurred by the builder as indirect costs or are paid for by the builder to a service organization.

Carload and truckload quantities generally represent the most important price-quantity breakpoints. For most products, these represent 10 to 50 dwellings.

Effect of Scale on Builders' Operations

Assessment of the effect of scale on builders' operations is extremely complex because of the multiplicity of methods of operation, organizational types, and businesses related to building.

Five organizational types of businesses are set forth in relation to volume. Generalized, different volume sizes are established approximately as follows: 15 units per year and less, 16 to 70 units per year, 70 to 300 units per year, 300 to between 500 and 700 per year, and over 500 to 700. Many other breakpoints could be established. Two other oranization categories are identified: (1) Sole proprietor, corporation, partnership, etc.; (2) Custom or merchant builder; or combination thereof.

Examples are set forth showing some substantial variations (but not the extremes) in the number of employees in builders' organizations in relation to volume.

Other operation and management factors related to volume are discussed. As volume increases, there is a tendency for builders to engage in more activities related to building, such as land development, real estate sales and management, commercial and other construction, mortgage finance, materials dealerships and fabrication, and related items.

As volume increases, there is a tendency to build on more than one site in a community and in more than one community.

As volume increases, there is a tendency to diversify by building different types of structures, i.e., apartments, motels, shopping centers, nursing homes, etc. Mortgage finance patterns of use tend to change as volume increases.

As volume increases, there is a tendency to use more components.

The scalar effects on builders' operations are discussed for land, land development, materials, subcontracting, indirect costs, general and administrative costs, and marketing and financing costs.

Overall efficiency effects are evaluated in relationship to volume, and an attempt is made to summarize the builders' comments into general conclusions.

Manufacturers' Methods and Criteria for Determining Minimum Volume Potential Necessary to Induce Investment in New Product Development

Manufacturers supplying information represented a wide range in size, a broad variety of end products produced, and raw materials used. Sufficient uniformity in response was obtained to lead one to believe that the information is representative of building industry practice.

A typical method is outlined with comments for the process used by manufacturers to determine whether to invest in new product development. The method typically involves detailed careful study and quantification.

Criteria applied by manufacturers in the process of judging whether to invest in new product development are set forth and are discussed in detail. Potential market volume is one factor, but it is not as important as yield and likelihood of success.

CONCLUSIONS

The objectives of this study are extremely complex particularly in relationship to the time and cost constraints. Therefore, only preliminary and tentative conclusions are in order.

The size of the sample of builders interviewed is very small in relation to the builder universe, but the sample represents wide variations in geography, types of operation, sizes of operation, and types of business methods. The sample is not necessarily statistically representative of all variables.

The nature of the information obtained is considered by most respondents to be at least reasonably private, if not completely confidential. The information that was obtained is considered to have a high degree of accuracy. Excellent cooperation was received from the respondents based in no small measure on the existence of a favorable personal relationship between the respondents and the NAHB Research Foundation, Inc., and its investigators.

For equal-worth dwellings, cost reduction in a competitive economy increases value. Cost reductions, therefore, are examined to determine whether they vary with volume and whether they are basically dependent or independent of volume.

1. The following conclusions, related to The Accounting System for All Builders, are only tentative and preliminary in nature, but within the time and cost constraints, they are made as specific as possible:

   A. The price of raw acreage is essentially independent of volume. No major breakpoints in price/volume were obtained. Opinions differ, with some builders crediting very large volume with some price advantage, but this may be offset by interest charges and taxes. Others credit single odd lots with a price advantage. On balance, economies of scale beyond enough land for from 50 to 100 dwellings are doubtful.

B. Opinions concerning economies of scale for cost of land development show more uniformity. Most builders thought maximum or very near maximum economies of scale could be achieved when developing 50 or more lots. Some favored an economic breakpoint of 100 lots.

C. Most builders believe there are some economies of scale related to labor as volume increases to about 100 units per year. These are offset partly or completely by added indirect costs for management and supervision.

D. Most builders believe that maximum economies of scale occur for subcontracts when a volume of 50 to 100 units per year is reached. There are a few who believe volume in the order of 500 to 700 dwellings per year is necessary to achieve minimum subcontract price.

E. Indirect costs per unit tend to decline as volume increases, but the relation is not linear and has discontinuities. However, indirect costs are essentially dependent on volume, so per unit decline as volume increases is most probably very nominal.

F. General and administrative costs are essentially dependent on volume. Any tendency for their per unit costs to decline as volume increases would be very modest and would depend in large measure on management decisions.

G. Maximum or near maximum economies of scale for marketing costs apparently can be achieved as volume reaches from 100 to about 300 dwellings per year. This may result in economies of from 1/2 to one percent of sales price. On the other hand, per unit marketing costs can actually increase with large volume. Marketing costs are highly variable and primarily dependent on general and local market conditions.

H. Primarily, financing costs are directly related to volume and the price of money.

2. There are some economies of scale for materials purchasing. Truckload and carload quantities represent the primary breakpoints. Maximum or near-maximum economies are achieved for most materials and products at volumes equivalent to about 10 to 50 dwellings. For some materials, the maximum price advantage occurs at a volume of about 100 dwellings, and for example, for appliances, it may be as high as 500 to 600 units.

3. Many builders buying truckload and carload quantities of materials believe that their indirect cost increases related to volume purchases about offset the price advantage of volume purchases.

4. There are a number of factors other than volume that affect price of materials. Such factors are the distribution system, categories of buyers, variations in product quality and specification, required servicing, price variations with time, delivery and other local items.

5. All other things being equal, management, materials utilization, labor restrictions, requirements for land use and development, location of buildings within a community, geography, weather, codes and zoning, regulations and taxes affect costs independently of volume. Labor productivity and effect of repetition tend to be dependent on volume and tend to cause decline in per unit costs as volume increases. Per unit developed land costs, including interest, taxes and related expenses, may increase as volume becomes very large.

6. Data based on large samples of NAHB builder members show that from 1959 to 1964 the percentage of builders of from one to 25 dwellings per year increased and that they increased their proportion of all units built from 1959 to 1964. From 1959 to 1964, the percentage of builder of from

26 to 100 dwellings per year declined slightly, but they accounted for a somewhat larger percent of the total number of dwellings built in 1964 compared to 1959. There was a decline in the percentage of builders building over 101 dwellings per year and a decline in the percent of the total market accounted for by these builders from 1959 to 1964. The number of builders building more than 200 dwellings per year declined from 1964 to 1967.

7. The likelihood of success and yield on invested capital and capital-in-use are the key factors in manufacturers' determinations of whether to invest in new product development.

8. The minimum market potential required to induce manufacturers to invest in new product development is not the primary factor in manufacturers' determining whether to invest in expenditures for new product development. Most manufacturers believe there is a much more than adequate market potential for new products for low-priced dwellings -- the key problem is how to achieve it. Minimum market potentials necessary to induce investment in product development vary from $50,000 to $50,000,000. When this is translated into products for dwellings, it represents on the low side from perhaps 1,000 to 5,000 dwellings and from 50,000 to 100,000 dwellings on the high side. However, as dollar volume of product per number of dwellings increases, the necessary market potential in terms of number of dwellings tends to decrease.

9. Within the limitations of this study, it appears that many builders believe that maximum or near maximum overall efficiencies can be achieved at a volume of about 70 to 100 dwellings per year. In addition, most builders believe that small volume builders (15 units per year and under) have inherent efficiencies of low overhead, personal and direct

supervision, and some efficiencies related to lower advertising and related costs. Some builders of very large volume differed in their views of economies of scale above 100 units per year. Some of these believe that there are no economies of scale above 100 units per year or that if there are any such economies they are exceedingly small. On the other hand, there is some sentiment among very large volume builders favoring 500 to 700 units per year as the number required to achieve maximum economies of scale.

STUDY OBJECTIVES

This study has two principal objectives:

1. Determination of the effect of volume on the cost of residential construction
2. Determination of the market potential required to induce manufacturers to invest in the development of new products for use in low-cost housing.

Both of the above objectives are broad in scope and very complex. This study was necessarily limited by the time and cost constraints to a pilot study of the following principal subjects:

1. Preparing a list of materials normally used in the construction of low and moderate cost single and multifamily dwellings
2. Obtaining information on price-quantity breakpoints for building products produced by major manufacturers for the products normally used in low and moderate cost housing
3. Investigating the effect of volume on the efficiency of builders' site operations and management
4. Investigating the methods and criteria used by major building product manufacturers for determining the minimum potential necessary to induce investment in new products
5. Summarizing and evaluating the facts and information obtained in a summary report.

STUDY METHOD

At the outset, three Foundation employees (the Staff Vice President, the Director of Laboratory Services, and a Senior Architectural Engineer) examined the scope and objectives of the study, outlined a work program, prepared a schedule, and initiated work.

A list of manufacturers representative of major building materials and major products was compiled.

A letter was prepared and sent to 25 major building products manufacturers requesting their assistance in providing information concerning:

- Price-quantity breakpoints on their materials and products
- Methods and criteria they use to determine whether to invest in new product research, development, production and marketing

Replies were received from 18 of these manufacturers. In addition to the information provided by them, supplemental data were obtained through personal interviews and telephone conversations with some of these and other manufacturers.

A list of builders, representative of the industry and known to the NAHB Research Foundation, was prepared to provide distribution by volume, by geographic location, and by type of operation. An outline of builder questions and desired information was prepared, and three Foundation employees personally interviewed 34 builders to obtain pertinent information. Builders interviewed included those whose volume ranged from 6 to 4,910 dwelling units per year in the following states:

New York	Virginia	Tennessee	Colorado
New Jersey	Georgia	Ohio	Texas
Pennsylvania	Florida	Michigan	Arizona
Maryland		Indiana	California
		Illinois	Washington
			Iowa

Information and data were collected, and then summarized, evaluated, and prepared in the form of this report.

After the data and information had been evaluated and summarized, the three persons, who were primarily responsible for working on the study, jointly developed an outline of a more comprehensive program that would be required to study the same objectives, but would be designed to obtain considerably more information in greater depth than was possible within the time and cost constraints of this report. This outline has been submitted in a separate document.

The contract did not require consideration of all cost and other factors pertinent to consideration of value (worth per unit of cost) and their relationship, if any, to scale of production. However, the Foundation elected to include a brief listing and discussion of these items in order to present a cohesive and broad spectral view of the economies of scale related to residential construction.

ECONOMIES OF SCALE - AN OVERVIEW

It is hypothesized that there are economies of scale when a "larger" number of units are built compared to a "smaller" number. A primary objective of this study is to investigate the "economies of scale" and to determine whether and to what extent, at least for materials prices and builders' site operations, increases in volume do affect economies. The study implies the need to determine the answer to the following question:

> How many dwelling units (or dollar volume) must be built per year to achieve near-maximum economies?

For a given dwelling unit, this question may be restated as follows:

> How many dwelling units must be built per year to achieve near-maximum ability to build equal worth for the lowest unit cost, i.e, as worth remains constant, what volume is required to achieve the highest value?

For equal worth, value in a competitive, free enterprise system will be affected by the ability to lower costs. Therefore, it is pertinent to the broad objectives of this study to examine all costs to (1) determine whether they are dependent on or independent of volume and (2) to examine other factors that affect cost that may or may not vary by volume.

It is beyond the scope of this project to examine all such other costs and factors that affect costs, to quantify these factors and costs, and to prepare an impact analysis of their effect or lack of effect on economies of scale. Even though these other costs and factors are beyond the scope of this project, the NAHB Research Foundation believed this report would be more meaningful if some information and discussion of these items were included.

Primary Costs

In the construction of dwelling units for sale or for rent, there are a number of recognized major cost elements. Such elements include materials, labor, land and its development, financing, sales, and indirect and general administrative costs. These are listed in detail and are briefly discussed below in relation to volume. The National Association of Home Builders The Accounting System for All Builders is used as the basis for identifying these items.

Some of these cost items vary with volume, and others are essentially independent of volume. In this presentation and discussion, items in the Accounting System that refer to the management of properties, to the performance of other services related to construction, and to related businesses not essential to the business of home building have been omitted since they are not germane to the subject of this report.

13200 Raw Acreage

The Raw Acreage Cost Account includes purchase price of raw land with any attendant fees, financing costs incidental to the purchase of raw land, general real estate assessments applicable to raw acreage, and all other expenses applicable to raw acreage such as legal fees, marketing fees, insurance fees, etc.

For each locality with fixed tax rates and fixed legal requirements, the above cost items are essentially independent of volume with the exception of purchase price and financing and interest costs.

It is almost impossible to make comparative costs of the price of land because no piece of land is identical to another at least for residential purposes. There is some indication that comparative price per lot may be less on larger tracts of land that have reasonably equivalent value as a place to live and that have equivalent

development costs per lot when compared to small tracts. This is not always true since in many cases, larger tracts frequently must be purchased from several different owners, and if any one owner "holds out" for a higher price, the cost of acquiring the entire tract can be increased. It is relatively well-known that communities require more concessions and impose more cost-increasing requirements on the developers of large tracts of land than on the small developers, e.g., larger sewers to accommodate future growth beyond the tract, donation of land for schools, parks, etc., and maximum standards for practically everything. Some large land developers say that it seems to be "an application of a policy to soak the big." Furthermore, there are a number of known examples where very small volume builders have been able to purchase one or a few "by-passed" lots for a lower price than the per lot cost of very large developments.

For reasonably equivalent pieces of land, the economies of scale with respect to the price of land appear to be doubtful once the size of the tract exceeds, say, 20-40 acres, but this is extremely difficult to evaluate.

Upon occasion, well-established businessmen-builders can obtain financing arrangements for land, including interest rates that are slightly more beneficial than the rates and costs achieved by other builders. However, this appears to be more a function of the builder's business history and ability rather than a function of scale.

In summary, the principal differences in cost of raw acreage above some reasonable minimum, such as enough for 50 to 100 dwellings, seem to be relatively independent of scale.

14100 Development Cost of Land

Development cost of land includes financing and interest costs, taxes, bonding fees, land planning fees, engineering fees, rough grading, street grading, paving, curbs, gutters, sidewalks, storm sewers and other drainage, sanitary sewer, water, electricity, gas, and "other", such as street lighting, etc.

Financing and interest costs, realty taxes and bonding fees are relatively independent of volume of construction. The balance of the items are dependent in part on volume and in general, become somewhat more economical per developed lot as the volume increases. Finer conclusions on this subject are impossible to ascertain within the scope of this project because of the tremendous number of variables. Such variables include standards and requirements, topography of land and many other factors that effect these costs. It appears, however, that near maximum efficiency of scale for the items herein that are somewhat related to volume can be achieved in the development of about 50 lots. This, however, can vary widely. For example, the amount of rough grading involved in production of 50 finished lots on hilly terrain could greatly exceed the amount of rough grading required for as many as 500 lots on relatively level or gently sloping terrain, because the cost of grading is essentially a matter of cubic yards per mile.

14300 Direct Construction Costs

Direct construction costs include only those labor and materials items in a dwelling that would not occur if that particular dwelling were not built. It does not include items such as callbacks, architectural fees, shop and

and office materials, superintendent's salary, equipment maintenance, warehouse expense, heat during construction, construction loan costs, points on mortgage, sales commission, etc.

Direct construction costs comprise a large and significant cost account. They include, broadly speaking, preparation, rough structure, full enclosure, finishing trades, completion and inspection and "other".

These broad categories include the following:

- Preparation includes items such as permits, fees, site work, demolition, utility connections, footings and foundations.
- Rough structure includes framing, concrete, rough electrical, rough plumbing, and rough heating.
- Full enclosure includes roofing, masonry, windows and doors, insulation, exterior trim, exterior paint, stairs, etc.
- Finishing trades include drywall and plaster, ceramic tile, finish carpentry and trim, flooring and floor-covering, cabinets and vanities, interior decoration, finish electrical, finish plumbing, finish heating, appliances and appointments, etc.
- Completion and inspection includes clean-up, landscaping, final inspection and "punch list" of completion and related items.

The cost of almost all of the above items, with perhaps the exception of permits and fees, which are usually on the basis of dollar volume or numbers of units, may be expected to vary with volume. The cost of materials and subcontracts are also being examined and discussed in detail in the sections of this report that deal with price/quantity breakpoints of materials and the effect of volume on builders operations.

14400 Indirect Construction Costs

In common parlance, indirect construction costs are some of the so-called overhead items. This account includes:

- Wages of supervisory personnel such as foremen.
- Salaries of purchasing personnel.
- Salaries and fees for architectural and drafting services.
- Salaries for time-keepers, watchmen, etc.
- Expenses for equipment such as maintenance and repair costs; fuel, oil, and lubrication; operators' salaries.
- Costs for depreciation, insurance and taxes on equipment and tools.
- Expenses for automobiles and trucks.
- Expenses for field office, warehousing and maintenance of the house during construction and until delivered to the customer.
- Warranty expenses.
- Costs of lost time of non-salaried employees as a result of vacations, etc., and expendable small tools and supplies.
- Bonding fees for construction.
- Expenses for product research, development or testing, and similar items.

These costs are primarily dependent on volume, but are not in exact proportion to volume. They are charges not precisely assignable to any one house.

By definition, most of these costs increase as volume increases, and, therefore, are relatively less significant when

examining the economies of scale than are other cost accounts. Some of these costs will be somewhat lower on a per-unit basis as volume increases, but others are almost directly related to volume. For each item, there is theoretically an economic volume. For example, architectural and drafting salaries and wages are fixed. While this is somewhat independent of volume, the total amount is relatively dependent on volume once a minimum volume has been achieved. Wages and salaries of equipment operators are also relatively directly dependent on volume. On the other hand, field office expenses, warehousing expenses, and wages of supervisory personnel are only partially dependent on volume.

In summary, indirect construction costs per unit tend to decline as volume increases. This relationship, however, is not linear and has a series of discontinuities.

15000 Finished House Inventory

The finished house inventory account includes the summary of direct construction costs and indirect construction costs which have previously been noted. It also includes the cost of trade-in houses held for resale including maintenance, refurbishing and carrying costs until resold; repossessing houses, including maintenance and refurbishing until resold; and the construction costs and carrying charges for model houses.

The above costs are, for the most part, directly related to volume with the exception of some of the previously-discussed indirect construction costs. The cost of trade-in and repossessions can be substantial and require management ability and skill to avoid losses. These costs

are directly related to volume for a given type of building operation with the exception that indirect costs related to trade-ins may be expected to decline slightly as volume increases. The same holds true for repossession costs. Usually, model homes are built only by builders of, say, 30 to 50 homes per year or more. Model homes represent a substantial cost-per-dwelling-unit-sold. These costs are dependent on volume and generally decline per dwelling unit as volume increases. The relationship is not linear because as volume increases, it is necessary to add additional models, and costs go up accordingly.

40000 Cost of Sales

The cost of sales includes the cost of raw land, finished lots, houses and trade-ins which have previously been discussed. It also includes direct costs related to warehouse and miscellaneous subcontracting performed for others, commissions and miscellaneous other items.

As volume increases, costs related to sales commission income per dwelling may decrease slightly. Direct costs related to warehousing operations (or shop) are generally dependent on volume. As volume increases, additional space, services, and costs are involved. Therefore, per-unit costs tend to remain constant, but with discontinuities as volume, space, and services vary.

50000 Financing Expense

Financing expense includes interim financing costs for construction loans, fees for commitments, origination or standby fees, interest on notes or mortgages, discounts on mortgages (points), closing costs paid for the customer, hazard or builder's risk insurance, and other financing costs. Interim financing costs include interest on construction loans, fees, and appraisals, inspections by lending institutions and government agencies, and title and recording fees.

In general, financing expenses are directly related to number of dwelling units and to dollar volume. All money is loaned essentially on a yield basis. Fees for appraisals and inspections and title and recording fees are essentially on a per-unit or per-dollar-volume-per-unit basis and vary directly with volume. Accordingly, financing expenses are relatively independent of volume and represent a substantial cost of building. The one exception might be that well-established, large-volume builders can, upon occasion, obtain advance commitments on a relatively more favorable yield basis in anticipation of an upward trend in yield, but such an advantage of "volume" would be slight and subject to change at the discretion of the lending institution.

60000 Marketing Expense

Marketing expense includes items such as salaries and commissions, advertising costs, sales office expense, model house maintenance, sales showroom expense, sales training expense, market research and consultation, and other marketing expenses.

All of these are somewhat dependent on volume. In some instances, commissions to brokers or sales fees per unit

decrease as volume increases and may amount to a difference of perhaps as much as one-half percent of the sales price. In general, the same relationship exists in the case of the builder maintaining his own sales and marketing operation. There is some evidence to indicate that this is not economical until a volume of about 100 to 300 dwelling units per year is reached -- but this depends in part on sales price. The overall tendency is for marketing expenses per dwelling unit to decline very little as volume increases, but as volume reaches 100 units, negotiated realty contracts or the builder's own sales force tend to lower marketing expenses slightly. This decline could represent one percent of sales price compared to a very low volume. However, this is a variable cost, and it depends in large part on the market conditions at the time of sale. In fact, large volume builders with a large number of dwellings under construction at one time can experience a market condition that requires one to 2 percent or more greater expenditure for marketing expense than the small volume builder would experience under the same circumstances.

80000 General and Administrative Expenses

General-and-administrative expenses consist of salaries, office expense, depreciation and amortization, taxes, insurance, professional fees, travel, entertainment, contributions, and other expenses such as bonding company employees, corporate expenses, contributions to profit-sharing plans, directors' fees, dues and subscriptions, and miscellaneous.

These expenses do not vary directly with volume for a given operation and are frequently referred to as fixed expenses. They can vary as a result of management decisions. Their unit costs may vary with volume to some extent, that is, as volume increases, their per-dwelling-unit cost may decrease, but this relationship would not be linear and such a decrease would be relatively modest.

90000 Other Expense

Other expense includes provision for income taxes, bad debt expense and loss on sale of assets..

Essentially, these items are independent of volume since corporate income taxes are by far the dominant factor in these expenses. Federal taxes are at a constant rate for net income before taxes of $25,000 and up. Some state income taxes on corporations have a variable tax rate, but their effect would generally tend to increase costs as volume increases.

Secondary Factors Affecting Cost

There are a number of other factors that affect cost for dwellings of equal worth or function. Even though the effect of these factors eventually are recorded in the Accounting System, they merit special examination and comment particularly in relation to their variation, if any, with volume. Some of these items, such as management and productivity, will also be discussed under the heading of "Effect of Volume on Builders' Site Operations". They are discussed briefly here, however, to present a cohesive and overall view.

1. Management

   The residential building process for even 100 dwelling units is complex. For efficient production, this process requires substantial abilities, knowledge and managerial skills, and, as one of the builders interviewed stated, "Luck".

   Luck may seem facetious. It can, however, be a factor since many actions by people or organizations that are completely beyond the control of the builder can occur and can have disastrous effects on the building business. For example, a builder may buy a piece of land upon assurance from a municipal official that an access street or trunk sewer will be extended. After purchase of the land, however, the community may reverse its decision and decide against extending the street or sewer. The cost of extending the access street or trunk sewer can make the cost of the developed land uneconomical. This can and does happen and is entirely independent of volume. It should be noted that this is more likely to occur in the case of large volume operations than in cases where only a few lots are involved.

Managerial skills are becoming increasingly important for builders in order for them to remain competitive in the residential building business. For example, overall costs can be affected by the ability to purchase land wisely as opposed to "for a good price". For example, if land is purchased and developed and homes or apartments are built in an area "not quite ready for the market", sales will be slow, interest charges and taxes will be high, and overall costs will be increased. This phenomenon is essentially independent of volume, but it is less likely to occur in the case of large volume since more marketing talent is either on the staff of or is available to the large volume builder. Yet the need to judge the market better is greater for a large volume builder than it is for a small volume builder.

Market research and design of the dwellings can also be key factors in sales or rental of the completed units. Skill in selecting the right location at the right time with the right design for the right market can have an important effect on the rate of sales and can either decrease or increase sales and financing costs. Increased sales and financing costs due to low levels of marketing and design skills are less likely to occur in the case of larger volume production, but this is highly variable.

Two builders building essentially identical dwelling units and paying essentially identical prices for labor and materials, land, money, and services may not achieve essentially identical costs. Supervision, work planning,

scheduling, and materials handling can all affect costs for essentially equivalent dwelling units built in essentially equivalent volume. The skill of the builder in carrying out these important managerial functions can result in cost differences independent of volume.

The scope of this study was too limited to draw general conclusions about the relation of volume to these managerial abilities. In general, the larger volume builder has available more talent related to the above subjects, but he also has a larger and more complicated task for this talent to perform. The very existence over a long time in this competitive economy of a large number of small volume builders tends to indicate that their per-dwelling-unit managerial ability compares favorably with the per-dwelling-unit managerial abilities of the larger volume producer.

The ability of a builder to construct in a shorter period rather than a longer period will affect his financing costs and, of course, the return on his invested capital. Ordinarily, the shorter construction schedule, if the job is under complete control and productivity is maintained, will result in lower overall costs if for no other reason than a reduction in interest charges. This phenomenon is essentially independent of volume. As a matter of fact, for equal conditions, there is some evidence to indicate that the length of construction schedule tends to be greater as volume increases, but adequate data are not at hand to draw firm conclusions on this point. While interest charges rise as the scheduled construction time

increases, some builders believe that this is more than offset by the ability to reduce the costs related to "haste makes waste".

2. Materials Utilization

For two equivalent dwellings of equal worth, there can be important cost differences related to materials utilization, materials scrap and waste, and least-cost engineering design. In general, the ability to reduce costs through application of these techniques increases as volume increases. However, during the course of this study and from previous experience, the Research Foundation has knowledge of builders, whose volume is between 15 and 100 dwelling units per year, who achieve very high degrees of materials utilization, affect excellent least-cost engineered designs, and have a minimum of scrap and waste.

3. Labor

Aside from the question of wage prices, there are differences in productivity of labor in different parts of the country. Such differences appear to be independent of the volume of construction or design of the dwelling with one important exception: Information obtained from builders, industrial engineering studies of site construction by the Research Foundation, and other data indicate that the well-known labor-learning curve in factories is applicable to residential site construction. That is, there is a reduction in labor content as the number of repetitive operations increases. This reduction may range between 10 and 20 percent each

time the number of operations is doubled, for the first few times (i.e., 100, 90, 81, 72.9, 65.5 -- a 10-percent curve for a total of 31 repetitions -- 1, 2, 4, 8, 16). This cannot be applied to total man-hour content since it is only applicable to that portion of the total work content which is unfamiliar. It could not, for example, be applied to nailing, fastening, or handling, but could be applied to measuring, cutting, operations sequence, etc. The effect of the labor-learning curve can be distinctly beneficial in reducing cost as volume increases provided design elements (not necessarily appearance) are repeated. Such repetition may have other cost-reducing advantages (see below).

In addition, in some areas of the country, essentially local restrictions are imposed on labor and productivity. These do affect productivity and cost and are independent of volume.

4. Repetition

Repetition of design elements, as noted, can reduce costs for labor as noted above. It can also reduce costs for purchasing, delivery, materials handling, scrap and waste, and related items. Repetition of design elements becomes more feasible as volume increases.

5. Land

The price of land, allowable land density, and subdivision development standards and requirements can substantially affect costs for two dwelling units of equivalent worth as a place to live. This is so obvious it need not be discussed further

except to note that these major factors essentially are independent of volume (see land acreage cost discussion above).

6. Location of Building Project

For equal volume of equivalent designs, the location of the building project can have an important effect on costs, aside from material and wage prices. It appears that building in older and larger cities on urban renewal ground would represent the highest cost location in which to build. This is aside from the question of the requirements of the codes; but it is a function of the number of departments, the number of regulations, the involvements of zoning, Federal contracts and restrictions, and, in general, the complications of dealing with multiple departments in larger and older cities. On the other hand, building in suburban areas that have smaller and younger governments with fewer departments generally means fewer complications and closer cooperation. Under the circumstances, the job generally can proceed faster and will have lower overhead costs related to many factors both prior to and during construction. The preceding is perhaps an overgeneralization, but it makes the point. The above type of cost differences appear to vary independent of volume although the per-unit overhead and indirect cost would be reduced somewhat as volume increases.

7. Geography

The topography and the location of the building site can affect costs independent of volume. In general, nearly flat or gently

sloping land results in lower foundation, excavation, grading, materials handling, street paving, and sewer installation costs, whereas, the converse is true for steeply sloped land. These factors are relatively independent of volume.

8. Weather

Weather affects cost essentially independent of volume. It is, without a doubt, more costly to build in areas like Cleveland, Buffalo, Philadelphia, Washington, D.C., and Chicago than it is in areas such as Los Angeles, Miami, San Antonio, and even Atlanta, independent of the question of price of materials and price of wages and design of the dwelling. Cold, wind, snow, rain, and mud are all enemies of the construction time schedule, interest costs, productivity, and even materials utilization. On the latter item, for example, scrap and waste materials will invariably be higher when adverse weather conditions are present. For example, framing lumber will frequently be used to provide a mat for ready-mix concrete trucks to get over the mud, and in the process, some will be destroyed and much of it will be considered to be unsalvageable.

In addition, extreme hot or cold climates result in additional costs for heating, air conditioning, insulation, storm windows, insolation, and related items. These extra costs are independent of volume.

9. Codes and Zoning

All code requirements are eventually reflected in costs. So, to some extent, the effect of codes is integrated into overall costs. However, code requirements can affect costs in a more subtle way by, for example, requiring a type of

construction, a construction detail or a material that inherently is either more costly or requires more labor content per unit of performance than other requirements in other communities. Such cost increases are independent of volume.

In the cases of zoning and local governmental requirements, it has been observed that there seems to be a tendency for the municipal officials to require special concessions from large land developers that increase cost per-dwelling-unit, whereas, these are much less frequently required from small volume developers or builders. For example, in the case of a large development, the developer may be required to give or sell at a low price pieces of land for schools, parks or other public purposes. This, while not a major factor, is a cost element that tends to increase as volume increases.

10. Local and State Government Regulations, Ordinances, Taxes, Etc. Some communities have adopted ordinances that prohibit the burning of refuse and prevent stream pollution from soil erosion. In Ventura County, California, debris and trash removal from scrap and waste material typically costs builders an extra $100 per dwelling compared to burning. It has been estimated that stream pollution prevention due to soil erosion can easily cost $50 extra per lot.

A number of communities and states have special taxes that relate either to sales taxes on materials or dwellings, or they have special regulations with respect to fees for

filing and recording deeds, deeds of trust, etc. All of these extra costs are essentially independent of volume.

It is apparent from the above that there are a number of factors that affect cost for dwellings of equal worth. Some of these are dependent on volume. Most of the factors that are dependent on volume tend to exhibit decreases in unit costs as volume increases. However, for a few factors, the tendency is for unit costs to increase as volume increases. In all instances of cost factors dependent on volume, the relationship between cost and volume is not linear and usually has a number of discontinuities in the relationship as volume increases.

There are also a number of factors that affect cost that are independent of volume, that is, as volume increases, unit costs will remain the same or approximately the same.

Builder Volume Profile

The market for homes, for rent or for sale, is now and has been extremely competitive since fulfillment of the backlog of demand following World War II. Buyers and renters have many choices. In such a competitive free market, examination of the percentage of builders producing various volumes of dwellings and their proportion of the total market is pertinent to the question of economies of scale.

In 1959 and in 1964, the National Association of Home Builders undertook major surveys of its membership to determine, among other things, builder-volume distribution. Table I on the next page, sets forth this information for 1959 data; Table II shows the same information for 1964; and Table III summarizes and compares the data from Tables I and II.

It can be seen from all three tables that the percentage of builders building 1 to 25 dwelling units per year increased and that they increased

their proportion of all units built from 1959 to 1964. The tables also show that there was a small decline from 1959 to 1964 in the percent of builders building 26 to 100 dwelling units per year, but they accounted for a somewhat larger percent of the total number of dwellings built in 1964 compared to 1959. There was a decline in the percentage of builders building over 101 dwelling units per year and a decline in the percent of the total market accounted for by these builders from 1959 to 1964.

TABLE I

1959

Builders of this many units per year	Comprised this % of all NAHB Builders	and	Built this % of all units built by NAHB Builders
1-6	13.5		0.5
6-10	17.1		2.2
11-25	26.9		7.5
26-50	17.6		10.6
51-75	6.6		6.9
76-100	5.6		8.2
101-250	8.1		21.8
251-500	3.1		18.4
Over 500	1.5		23.9
	100.0		100.0

TABLE II

1964

Builders of this many units per year	Comprised this % of all NAHB Builders	and	Built this % of all units built by NAHB Builders
1-6	18.5		1.1
6-10	18.9		3.5
11-25	27.0		11.2
26-50	16.9		14.8
51-75	6.5		9.4
76-100	4.2		8.5
101-250	5.5		22.2
251-500	1.7		14.7
Over 500	0.8		14.7
	100.0		100.0

TABLE III

COMPARATIVE TABLE

Builders of this many units per year	Comprised this % of all NAHB Builders		and	Built this % of all units built by NAHB Builders	
	1959	1964		1959	1964
1-25	57.5	64.4		10.2	15.8
26-100	29.8	27.5		25.7	32.7
Over 101	12.7	7.0		64.1	51.6

Another study by the American Marketing Association and NAHB completed in October 1967 showed that the number of builders building 200 or more dwelling units per year decreased from 1964 to 1967.

The precise reasons for the occurrences reflected by the above data are most difficult to identify. It is certainly not because large-volume builders became less efficient from 1959 to 1964. It is most probably because the problems, constraints, and restrictions on large-volume builders increased proportionately during that period. The two most obvious problems are land and money.

It is becoming increasingly difficult and it requires increasingly larger sums of capital to obtain, develop, and build on large tracts of land. Therefore, fewer building companies have the financial capabilities to remain in the large-volume category.

In the past few years, the squeeze on interim construction money and particularly on permanent financing for mortages has considerably increased the risk of building in large volume. "Points" on mortgage money can quickly vary to such an extent that a modest profit can be turned into a loss. High and fluctuating financing costs are especially persuasive in dissuading

builders from undertaking construction of a large number of houses. The exposure and risk in a vacillating and costly money market are just too great for the long lead time required in large-volume construction.

With rising incomes and costs, the relative trend has been to higher priced houses, and it is believed that this tends to favor the competitive position of the small-volume builders of custom homes.

Although Americans have changed their attitudes about many consumer products, they have been extremely slow to change their basic attitude toward housing. The new home buyer apparently still wants a big, well-equipped suburban home that is traditional in appearance. It seems that the more the buyer earns, the more he adheres to this traditionally accepted way of home ownership life. While this does not directly favor the small-volume builder, it is believed that it tends to make it easier for him to compete with other types of builders.

As will be set forth in the following chapters, there are price-quantity advantages for materials purchased in volume and certain other efficiencies related to scale for large-volume builders. Yet, builders of 1 to 25 dwellings per year represented about 60 percent of the total number of builders in 1959 and 1964, and, from 1959 to 1964, that percentage of the total number of builders increased and they increased their share of the total market. In addition, builders of 26 to 100 units per year comprised more than one-fourth of the total number of builders, and, from 1959 to 1964, they increased their percentage of the total market. During the same period, the percent of builders whose volume exceeded 101 dwelling units per year decreased and their share of the total market decreased. On the other hand, in 1964 builders of 101 or more dwellings per year represented only 7 percent of the total number of builders, but they accounted for more than one-half of the total market.

Thus, it might be argued that this shows there are economies of scale when volume exceeds 101 dwellings per year.

The data in Tables I, II, and III are based on large samples of the industry.

There seems to be little question that during the past decade the market has been free and competitive and that buyers and renters have had many choices. From the above data, it appears that the dwellings produced by builders of 100 or fewer units per year for sale or for rent competed favorably with the dwellings produced by the larger-volume builders. While there are many factors that affect the choices of a buyer and renter, cost-per-unit-of-worth certainly is a significant factor. In summary, these data tend to indicate that for the period 1959-1964, there are only minor economies of scale in volume over 10 to 100 dwelling units per year in volume. This might be offset by the argument that builders of 101 or more units per year obtained more than one-half of the market but, as has been stated before, represented only 7 percent of the number of builders. This subject of the economies of scale is extremely complex and cannot be examined exhaustively within the time and cost constraints of this project.

The preceding builder-volume data are included in this report to provide a more comprehensive understanding of the "economies of scale" during the past decade. The inclusion of this data is not intended to imply that the same situation will hold true in the future.

Dwelling Cost Breakdown

A major element of this study refers to price/quantity breakpoints for materials. Accordingly, an example is included of a reasonably typical cost breakdown of a single family dwelling that sells in the medium price range, say $23,000.

Cost Breakdown Example

Developed Lot Costs		22%
Sales & Marketing Costs		5%
Financing Costs (with only a few "points")		6%
Indirect, General and Administration Costs, and Profit		12%
Direct Construction Costs		55%
Materials	70-75%	
Labor	30-25%	

Therefore, in a $23,000 home, materials costs might be expected to be 70 to 75 percent of 55 percent or $8,900 to $9,500. It should be understood that the above cost breakdown is only an example and that the price of land, the cost of developing land, and the cost of financing can vary substantially. This could effect the above percentages significantly.

LIST OF PRODUCTS & SERVICES

The following is a listing of products and services utilized in the construction of moderate to low-cost single-family and multi-family dwelling units. The elements that constitute the major portion of the total direct construction costs in single and multi-family dwelling units have been asterisked.

<u>List of Products & Services Normally Required in Construction of Moderate to Low-Cost Single & Multi-Family Dwellings</u>

Planning Fees -
- Land planning
- Architect
- Engineer

Building Permits
Completion Bonds
*Street Paving & Curb -- Concrete & Asphalt
Surveyor - Stakeout

*Excavating
- Equipment rental
- Equipment purchase

Foundation
- *Concrete (formed and reinforced)
- *Reinforcing steel/mesh
- *Masonry block

Waterproof Foundation
Termite Protection
Stone Fill
Drain Tile
Vapor Barrier
*Concrete (slab) Readymix

Floor System
- *Wood joists
- *Wood beams
- *Steel beams
- Steel posts and columns
- *Plywood sheathing
- *Board sheathing
- Ventilators
- Nails
  - *Regular
  - *Power driven

- *Finish materials
  - *Underlayment
    - *Plywood
    - *Particleboard
    - *Hardboard
  - *Carpet
  - *Vinyl sheet
  - *Vinyl asbestos tile
  - *Asphalt tile
  - *Wood flooring
  - *Ceramic tile
- Concrete
  - *Formed and poured
  - *Precast/prestressed planks

Wall System

- Wood framing lumber
  - *Studs
  - *Plates
  - *Headers
- Sheathing
  - *Insulation board
  - *Plywood
- *Insulation
- *Gypsum board
- *Plaster
- *Brick
- Masonry
  - *Block
  - *Brick
- Exterior finish
  - *Wood siding
    - Boards
    - Plywood
    - Hardboard
    - Composition Board
  - *Aluminum siding
  - *Brick veneer
  - *Stucco
- *Paint-stain
  - Interior
  - Exterior
- Caulking
- Sealants
- Concrete
  - *Formed and poured
  - *Precast panels
- Metal curtain wall systems

Roof-Ceiling System

- *Joists and rafters
- *Trusses
- *Sheathing
  - Plywood
  - Boards
- *Gypsum board

- Lath and plaster
- *Insulation
- Roofing felt
- Ventilators
- Fans
- *Shingles
  - Asbestos cement
  - Asphalt
  - Wood
- Tile
  - Cement
  - Clay
- Concrete
  - Formed and poured
  - Precast/prestressed

Plumbing

- *Pipe & fittings
  - Copper
  - Plastic
  - Galvanized steel
  - Cast iron
- *Fixtures
  - Water closets
  - Lavatories
    - China
    - Porcelain on cast iron
    - Porcelain on steel
- *Controls (brass)

Heating-Cooling

- *Ductwork
  - Metal
  - Fiberglass
  - Fibertube
  - Cement asbestos
  - Fired clay
- *Equipment - heat
  - Furnace
    - Gas
    - Electric
    - Oil
  - "Boiler"
    - Gas
    - Electric
    - Oil
  - Heat pump (cooling)
    - Electric
  - Electric baseboard
  - Electric radiant
- *Equipment - cooling
  - Condenser
  - Compressor
    - Electric
    - Gas

- Piping and insulation
  - Copper
  - Aluminum
- Charge system
  - Freon
  - Water (gas)
- Controls

*Electrical
- *Wire
  - Copper
  - Aluminum
- Receptacle boxes
- Switches and plugs
- *Fixtures
- *Entrance panel

Finish Materials
- *Windows with/without screens
  - Wood
  - Aluminum
  - Steel
  - Plastic
- *Doors
  - *Entry
    - Wood
    - Steel
  - *Passage
    - Wood
  - *Closet
    - Wood
    - Steel
    - Molded plastic
  - *Garage
    - Wood
    - Steel
    - Aluminum
    - Reinforced plastic
  - *Sliding glass
    - Aluminum
    - Wood
- *Glass & mirrors
- *Ceramic tile
- *Millwork, trim
- *Kitchen cabinets
- *Appliances
  - Range-oven
  - Refrigerator
  - Disposer
  - Dishwasher
- *Gutters & downspouts
  - Galvanized
  - Aluminum
  - Plastic

*Shower doors
Exhaust fan
*Hardware
Bath accessories
Medicine cabinet
Wall coverings
Wall paper
Special wall panelings
Nails, screws, miscellaneous fasteners
Adhesives
Railings
Interior
Exterior
*Elevators
Entry mailboxes

Exterior Finish
*Driveway - walkways
Concrete
Asphalt
*Lawn
*Landscape
Fencing

PRICE-QUANTITY BREAKPOINTS FOR BUILDING PRODUCTS PRODUCED BY MAJOR MANUFACTURERS

The building-materials market was once described as a Turkish bazaar. While this description may not be exact, it conveys the idea with some accuracy that building materials prices are variable, subject to negotiation, and affected by many factors in addition to volume.

The tremendous number of building products and the major variables involved make it exceedingly difficult to do more than obtain indications of building materials price-quantity breakpoints within the time and cost constraints of this study.

Several major variable factors affect materials price-quantity breaks. These include:

- The distribution system
- Categories of buyers
- Variations in product quality and specifications
- Servicing, price variations with time, delivery conditions, and other localized factors

The Distribution System

For many building materials or products, the distribution system involves six typical purchasing patterns:

1. Manufacturer to builder
2. Manufacturer to distributor to builder
3. Manufacturer to distributor to dealer to builder
4. Manufacturer to distributor to dealer to subcontractor to builder
5. Manufacturer to distributor to subcontractor to builder
6. Manufacturer to subcontractor to builder

In addition, there are numerous variations or combinations of the above six patterns. For some types of materials, different terminology is used. Sometimes the term "jobber" or "wholesaler" is substituted for "distributor", or occasionally one of these may be an added element in the distribution chain. Occasionally, brokers may be involved as in the case of lumber, where brokers buy cars of materials in-transit for resale while still in transit to their customers.

Categories of End-Use Customers in the Industry

The several categories of end-use customers follow:

- Builders
- Prefabricators
- Original equipment manufacturers

In addition, builders, in some instances, have their own purchasing and materials inventorying companies, in which cases, they usually qualify for consideration as building-materials dealers. Sometimes, there are different pricing patterns for the above categories of customers regardless of volume.

Variations of Product Quality and Specifications

The study is complicated by the fact there are at least 20,000 and probably more than 100,000 specific different products sold to the residential construction industry. For example, a major building materials manufacturer supplied us with dealer price lists during the course of this study. For one type of material, which is primarily used as surfacing for outside walls and occasionally used inside, the manufacturer lists 113 different products -- that is, they have different sizes, thicknesses, finishes, and degrees of treatment, i.e., sanded or unsanded. Another manufacturer listed more than 50 different roofing products all with different specifications, sizes, appearances, colors,

composition, etc. Lumber and plywood are available in numerous thicknesses, lengths, widths, grades, species and finishes. The total number of possible lumber and plywood products is enormous. Unit prices for each vary slightly.

Servicing and Special Factors

Price-quantity breakpoints for materials and products are affected by servicing requirements of the end-use customer. The manner in which the products are delivered, stacked, wrapped, prefinished, precut, etc., affects price. In the case of products such as appliances, price is affected by presence or absence of service agreement, the need for special service, callbacks, and related items.

Many building products are heavy and bulky. Freight, shipping, and packaging are important factors in price actually paid. For example, in some parts of the country, freight from the West Coast can represent from one-fourth to one-third of the price for lumber products. In addition, freight costs vary with location, type of product, method of shipping, size and weight of shipment, etc. In most instances, delivery costs are an important factor in materials prices.

Prices for many building materials, such as lumber and plywood, fluctuate almost daily, and prices for many other products vary throughout the year.

In short, the complications of the distribution system, categories of buyers, variations in specifications and quality of products and servicing and special factors all greatly complicate the determination of price-quantity breakpoints. All of these factors affect price independently of volume.

Perhaps the best way to simply describe the residential building materials price market is to say that it is a negotiated market. Certainly, there are

price-quantity breakpoints, but, in addition, the variables mentioned on the preceeding pages and negotiation can and do affect price somewhat independently of volume.

Market conditions can and do affect price independently of volume. The competition among manufacturers is so keen that minor fluctuations in market conditions can cause additional trade discounts or incentives to be added to typical purchasing patterns. This occurs at times and is independent of volume.

All builders interviewed in this study plus previous experience of the NAHB Research Foundation indicate that builders are well aware of the significance of the cost of materials in relation to the total cost of the house. Without exception, the builders interviewed, whether they had large or small volume, recognized the above fact and exercised special effort to achieve the best possible materials prices.

Manufacturers are faced with legal requirements pertaining to the pricing of materials. This subject is beyond the scope of this study. Apparently, however, manufacturers must be able to account for price variations based on their actual savings or added cost for a particular set of conditions. This holds true not only in relation to volume, but also in relation to the costs of production, sales, distribution, and for all factors.

Manufacturers with established "distributors" and "dealers" can be expected to be reluctant to make arrangements for direct sale to large volume accounts, such as a builder, thereby reducing their established distributors' volume by that amount. This further complicates the price picture.

In order to qualify as a different and more beneficial category of buyer, some builders establish their own building materials dealerships and purchase some products and materials directly from manufacturers or distributors (jobbers, etc.). Some of the builders interviewed during the course of this

study do buy large quantities of materials more or less directly from manufacturers and perform the functions of purchasing, inventorying, unloading and loading, and other related services usually performed by building materials distributors or dealers. As can be seen below, builders who thus purchase in volume pay lower prices for the materials than those paid by builders who do not perform these services, but buy directly from building materials dealers.

Builders who do volume purchasing pointed out that the economic advantage of their "direct" purchasing system is very small, that their overhead cost including interest on unused inventory, warehousing costs, unloading and loading costs, and purchasing and accounting overhead costs, probably about offset their direct volume purchase advantage. They recognize that the maximum benefit they can gain is to recapture any portion of a mark-up in the distribution chain that is unrelated to the cost of the service performed and the profit of the by-passed elements in the distribution chain (The indication is that the profits of most established building materials dealers are quite nominal although this varies substantially. However, this subject is beyond the scope of this study.).

Builders who perform their own building materials "dealer" functions report, however, that there are two important reasons for engaging in such activity. First, the purchasing and inventorying of their own materials in quantity provides substantially better control for the entire production system. On the basis of information from builders interviewed, this seems to be particularly important as volume approaches 70 to 100 dwellings per year and up. There are cases, however, where some builders consider this important for volume of 15 to 20 dwelling units per year and other who think it is unimportant for volume of 400 or 500 and even 1,000 units per year.

It is obvious, however, that the cost of delays due to incorrect or late delivery or nonavailability of materials can be more costly for a tightly scheduled volume production system that when production is low. Large volume builders interviewed during the course of this study who do not purchase, handle, and inventory their own materials directly -- in effect as "dealers" -- have all developed very satisfactory arrangements for efficient purchase and delivery of materials from local established dealers or distributors.

Second, builders who do purchase, inventory, and handle materials as "dealers" do so, in part, because they believe it provides them better control of quality of the materials used and of the end product which they produce. This is not true, of course, for all materials and products, but it is true for some materials and products.

Specific Examples - Price-Quantity Materials Breakpoints - Builders

In the examples below, relative unit costs of products used per dwelling were developed for different volumes. The lowest unit cost quoted in each case represents the best price possible regardless of volume increase in the experience of that builder. Multiple examples are used to illustrate different conditions and practices.

Builder A — One very large volume builder believes that he achieves maximum economies of scale related to his overall operation -- of which materials price is one factor -- when he builds at the rate of approximately 15 dwellings per week in one location. Interestingly enough, 15 dwelling units represent about a truck load of appliances; 15 houses, essentially, represents one trailer load of asphalt shingles; and there are other similar cases.

Builder B — Another very large volume builder believes that they do not achieve any economies of scale for materials or subcontracts after volume reaches 100 units in a particular city -- this is regardless of time interval, although the 100 units is usually reached in less than one year.

Builder C — A builder of about 600 dwelling units per year stated that the economic volume for gypsumboard purchased is in carload lots (about 6 to 8 dwellings -- or 12 to 15 very small dwellings). By purchasing gypsumboard in carload quantities, he is able to buy at about 15 percent below the typcial builder price from dealers for one house quantities, but he has added cost for handling, financing, and delivery that essentially offset the "discount". In fact, his method of buying for this material is more a function of convenience and a contribution to the efficiency of his overall operation than of price. His economic volume for plumbing, heating, and electrical products is about 25 houses, and purchasing these items in larger volume has not produced any added price benefit.

Builder D — Plumbing:

1 house	1.00
10-15 houses	0.93
40 houses and up	0.80

Electrical:

10-12 houses	1.00
25 houses	0.95 to 0.97
50 houses	0.90

Readymix concrete:

1 to 4,000 cubic yards	1.00
More than 4,000 cubic yards on one job in one year	0.915

This is the only instance of a builder interviewed where a price-quantity break for a large volume of concrete was indicated. The typical practice is for unit cost to be the same, providing readymix concrete is delivered in quantitites of 3 to 4 cubic yards and up. A concrete slab-on-grade house with driveway and sidewalks would probably use 40 to 50 cubic yards of concrete. So 4,000 cubic yards represents in the order of 80 to 100 dwellings. On the other hand, a crawl space house with concrete footings and foundation walls might use only 5 cubic yards of concrete or 800 dwellings per 4,000 cubic yards.

Lumber:

1 house	1.00
Carload	0.86 (8-10 medium-size houses)

Trusses:

1 house (retail list)	1.00
25 houses	0.60 to 0.65

Sand: Economic volume, 10 houses

Vapor barrier, plastic film:

Economic volume, 50 houses

Perimeter insulation:

Economic volume, truckload - 100 houses

Aluminum foundation vents:

Economic volume, 50 houses (200 vents)

Hardboard siding:

Economic volume, carload - about 40 houses

Thermoply sheathing:

Economic volume, carload - about 80 houses

3/4-inch plywood subfloor:

Economic volume, carload - about 20 houses

3/8-inch plywood roof sheating:

Economic volume, carload - about 40 houses

Doors and windows:

Best possible price 50 houses

Millwork and trim:

Economic volume - 25 houses

Refrigerators:

Economic volume, about 100 houses

Kitchen cabinets:

Economic volume, 25 houses

Ranges:

Economic volume, truckload - 25 houses

Wall furnaces:

1/2 carload - 50 houses	1.00
1 carload - 100 houses	0.90

Vanitories:

Economic volume, 25 houses

One-piece showers with enclosure:

1	1.00
12 houses	0.89

Bathtub:

Retail list, 1 tub	1.00
2-11 tubs	0.66
12 or more	0.60

Hardware: Economic volume, about 25 houses

Roofing: Economic volume, 100 houses

Steel gutters:

1 house, retail list	1.00
9 houses	0.90
20 houses	0.81
40 houses (best price)	0.72

Builder E — Breakpoint for almost all materials, truckload or carload quantities with very little price difference between the two.

Builder F — Kitchen cabinets:

One house	1.00
Truckload quantities (about 15 to 20 houses)	0.77

Brick and block:

Economic volume one truckload, with very little advantage, perhaps 2 to 5 percent, for annual contract with price (fluctuation) protection for 100 houses.

Shingles:	
Retail list	1.00
Truckload quantities	0.875
Carload quantities	0.835
Roof trusses:	
One house	1.00
100 houses per year	0.90
Insulation:	
One house	1.00
Truckload (12-15 houses)	0.92
Windows:	
Retail list	1.00
One house for established builder	0.90
8 houses	0.68
(Note: This seems too low.)	
Nails:	
One 50-pound keg	1.00
1,000 pounds (about 4 or 5 houses)	0.905
Sliding glass doors:	
Economic volume, about 25 houses	
Closet doors:	
1-24 houses	1.00
25-49 houses	0.98
Over 50 houses	0.95
Locksets:	
One set	1.00
100 sets (about 10 houses)	0.95

Builder G

Millwork and trim:

Economic volume one carload (about 10 houses)

Carpeting:

Economic volume, one truckload

Gypsumboard:

One house	1.00
Truckload (about 7 or 8 small dwellings)	0.89
Carload (about 15 houses)	0.85

Doors: Economic volume, truckload (about 30 to 40 houses)

One house	1.00
30 to 40 houses	0.95

Heating and cooling equipment:

Economic volume, 100 dwellings

Floor tile: Economic volume, truckload - about 40 houses)

Ceramic tile: Economic volume, about 6 houses

Electrical wiring devices:

Economic volume, about 10 houses

Lighting fixtures:

One house	1.00
15 or more houses	0.95

Builder H

A builder whose volume has varied from 40 to 700 dwelling units per year states that the economic volume for his operation, generally, is for materials commitments in groups of 15 dwellings to be delivered in a period of not more than 60 days.

Lumber and other typical building materials dealers' products:

Retail list	1.00
One house	0.95
15 houses (purchased through local established dealers)	0.925

Lap siding:

One house	1.00
One carload - 30-35 houses	0.89

In this specific instance, the builder orders and prepays the local dealer for the carload of siding. The car is delivered to the dealer, who unloads, inventories, and delivers the siding as the builder needs it. The builder pays 7 percent interest for construction loan funds and $7600.00 for this carload of siding. This is approximately $480.00 below dealer-to-builder price (in one house quantities). The siding is used in about four months. The dealer fee, paid in advance for the service rendered, is $400 and is included in the $7600.00. Interest expense on $7600.00 at 7 percent for 4 months equals $177.00. The savings to this builder using this method, therefore, is $480.00 less $177.00 or $303.00. This translates into a cost reduction of 0.82 cents per square foot of coverage of the siding compared to the regular dealer-to-builder price in one house quantities.

This detailed example is included to illustrate the specific cost effect per square foot of this volume purchase of this item, and for these circumstances.

Builder I	Large volume builder-fabricator	
	Lumber:	
	One carload, mixed	1.00
	10 carloads in one order	0.98
	Asphalt shingles:	
	One truckload	1.00
	One carload	0.98
	10 carloads	0.95
	Windows:	
	One truckload	1.00
	One carload	0.97
Builder J	Lumber: Economic volume, carload lots	
	Plywood: Economic volume, carload lots	
	Insulating sheathing: Economic volume, carload lots	
	Asbestos siding: Economic volume, truckload lots	
	Nails: Economic volume, truckload mixed (50 to 70 houses)	

The above examples serve to illustrate typical materials-price breakpoints of the builders interviewed. The data show variable comparative prices for similar products in similar quantities for different builders. This emphasizes that there are factors other than volume that affect materials price as noted before. It is apparent from the results of this study that building materials purchasing is a highly specialized endeavor in a very complex system.

Specific Examples - Price Quantity Materials Breakpoints - Manufacturers

In addition to obtaining information on price-quantity breakpoints for materials from builders, the Foundation was able to obtain additional information from manufacturers. Some of the manufacturers contacted declined to comment, and several replied that they would be unable to adequately reply to the complicated

question within the time limit.

All manufacturers compete with at least several other manufacturers who have similar or even identical products, and most manufacturers compete with manufacturers of other competitive materials. Accordingly, some manufacturers were somewhat reluctant to convey what they considered to be private pricing information to a source when they were aware that such information could eventually wind up in the public domain and be available to their competition. Nonetheless, the Foundation was able to obtain exemplary cooperation from enough manufacturers to fulfill adequately the purpose of this pilot investigation.

The manufacturer's problem in responding to a request for specific price-quantity breakpoint data is complicated by the same variables that affect the builder's ability to respond precisely to this question. The distribution system, the categories of buyers, the variations in product quality and specifications and servicing, price variation with time, and specialized requirements all greatly complicate price-quantity breakpoint analysis for building products.

A number of manufacturers who sell only to dealers, distributors, applicators, subcontractors, or others in the distribution system who are not end-product users, i.e., builders, prefabricators, etc., could only supply information by classification of customer or "category of buyer".

In the examples below, relative unit costs of products are set forth for different categories of buyers and for variations in volume. The following data are specific examples obtained from manufacturers:

Insulation

Dealers	1.00
Distributors and applicators	0.94

Asphalt Roofing

Dealers and applicators	1.00
Distributors	0.95

In the two cases above, this refers to truckload and carload quantities or approximately 15 houses for insulation and from 15 to 20 houses for asphalt roofing. Although no specific information could be obtained for these products in quantities greater than a carload, Foundation personnel ascertained that modest additional discounts of 1 to 3 percent are possible depending on market conditions for orders of 10 carloads or more.

Insulating Board Products including Decorative Ceiling Tile

Sheathing and Related Products

Dealer	1.00
Wholesaler	0.90 to 0.95

Siding Shingles

Same as above

Asbestos-Cement Board and Related Products

One-house volume	1.00
Truckload	0.91
Wholesaler	0.87

Asphalt Roofing Products

Dealer	1.00
Wholesaler	0.90 to 0.95

The above is for truckload and carload quantities with slight (1 to 2 percent) additional discounts possible for quantities in orders of 5 to 10 times the above amount.

One major building materials manufacturer stated that extremely large quantities (Implied: Several thousand dwellings at one site; materials delivered to one warehouse at one time) might enable the price to be reduced to about 0.85 for typical siding-roofing types of products.

Windows

Carload quantities	
Jobber to dealer price, retail list	1.00 (1 window)
Jobber	0.50
Dealer	0.63
Builder	0.75
Carload quantites	
Delivered direct to dealer or builder warehouse, retail list	1.00
Dealer	0.54
Builder	0.60
Major metropolitan market where manufacturer has speical warehouse facilities, and carloads are delivered to builder through jobber	
Retail list	1.00
Jobber	0.50
Builder	0.57
Carload quantities delivered direct to warehouse of original equipment manufacturer, prefabricator, or very-large volume builder (this is not defined, but implied volume is 500 or more dwellings per year on annual contract basis).	
Retail list	1.00
Prefabricator or builder	0.47

Hardboard and Related Siding and Interior Finish Products

Truckload from distribution center direct to end user	1.00
40,000-pound car	0.96
Minimum carload 60,000 pounds	0.95

The 60,000-pound carload represents enough material for approximately 40 modest-size dwellings, and a truckload represents enough material for approximately 20 modest-size dwellings. No better price is achievable for more than one carload.

Gypsumboard and Plaster Products

Major breakpoint is for minimum carload or minimum truckload quantities with no breakpoints for larger quantities. Minimum carload of gypsumboard would represent about 12 to 15 small dwellings.

Insulation Board Products

Dealer, one carload	1.00
Distributor	0.89 to 0.95

Floor Tile

Dealer or subcontractor	1.00
Warehousing distributor	0.91

Roofing Products

Dealer or subcontractor	1.00
Warehousing distributor	0.95

Lumber

Minimum carload, about 30,000 pounds	1.00
Maximum carload, 70,000 to 90,000 pounds	0.96
(Based on special freight rates for maximum cars)	
Maximum price benefit, essentially one carload for lumber and plywood materials	

Gypsumboard, Structural Plywood and Finish Plywood

Maximum price break, one carload	
Less than truckload quantities	1.00
Truckload	0.90 to 0.95
Carload Carload quantities for these products represent approximately 8 to 20 small dwellings	0.75 to 0.85

Aluminum Coil Stock

Base price 30,000-pound quantity; if converted to siding, this represents approximately 90 houses.	
30,000 pounds	1.00
15,000 to 30,000 pounds	1.03
10,000 to 15,000 pounds	1.05
No discounts for quantities greater than 30,000 pounds	

Finished Fabricated Aluminum Products

Lowest base price, truckload, approximately 40 houses to a distributor	1.00
Less than truckload quantities	1.05
No discount for even 10-truckload orders	

Fabricated Aluminum Products

Dealer price	1.00
Distributor price	0.95

Insulation

One carload	1.00
10 carloads	1.00
50 carloads	0.94
100 carloads	0.88

Decorative Ceiling Products, Acoustical Tile, Etc.

One carload	1.00
10 carloads	1.00
50 carloads	0.92
100 carloads	0.83

Bathtubs and Showers

One carload	1.00
10 carloads	1.00
100 carloads	0.80

Lumber

Carload - 40,000 to 60,000 board feet	1.00
Boat load (delivered to east coast), 500,000 board feet	0.97

(about 8 to 10 houses of dimension lumber per carload)

Aluminum Windows

About 40 houses per truckload

Retail list	1.00
Distributor (1/2 truckload)	0.50
Distributor (less than 1/2 truckload)	0.63
Builder (less than about 20 houses)	0.75
Builder 20 houses or more (no price break above 20 houses)	0.63

Aluminum Siding

Less than truckload, 1 to 30 houses	1.00
Truckload, approximately 30 houses	0.86

Aluminum Prefinished Soffits

Retail list	1.00
One to 9 houses	0.75
10 or more houses	0.675

Appliances

All kitchen and laundry appliances sold as a group

One house	1.00
Two houses	0.98
50 houses	0.92
200 houses	0.885
600 houses	0.85 to 0.825

Plumbing Fixtures

Retail list	1.00
Truckload quantitites	0.95
Multiple truckloads	0.90 to 0.85

"Sales to original equipment manufacturers would be expected to have a lower sales expense, and they might receive up to an additional 8 percent discount due to lower selling expense. However, this must be in strict legal compliance with the Robinson-Patman Act."

Marbelized Vanitory Tops

6 to 19 houses	1.00
20 to 49 houses	0.90
50 to 499 houses	0.82
Over 500 houses	0.78

Shutters

One to 9 houses	1.00
10 to 29 houses	0.86
30 to 299 houses	0.80
Over 300 houses	0.75

Lumber and Plywood

One to 10 carloads	1.00
11 to 50 carloads	0.97
In the order of 100 carloads	0.95

But above is variable depending on car mix, acutal sales and production costs, credit terms needed, and other factors.

Roof Trusses

One house	1.00
100 houses	1.00

For orders of over 100 houses, some negotiation possible, but only slight possibility for price reduction. Delivery is the key factor in cost, since only one house of trusses can be delivered at a time.

Summary

In summary, prices of residential building products depend on a number of factors other than volume. These include the distribution system, categories of buyers, variations in product quality and specifications, required servicing, freight and delivery conditions, price variations with time of the year, credit requirements, and other localized market factors.

The multiple examples of price variation with quantiy that are presented as obtained both from builders and manufacturers give some indication of the price effect of variables other than volume. In all cases, there are some price advantages for quantity purchases. It is beyond the scope of this study to obtain sufficient data, to prepare a detailed impact analysis, and to attempt to estimate the overall economic volume breakpoints related to quantity of materials purchased.

In many cases, substantial volume purchase of materials involves added cost for interest, inventorying, unloading, handling, loading, purchasing, accounting, and supervision. These costs offset volume purchase advantages in variable amounts.

In general, the breakpoint for major cost items such as structural and finish materials, masonry, brick, concrete, doors, windows, millwork, cabinets, roofing and siding products, gypsumboard, and floor coverings occurs between 10 and 50 dwellings per year, although the maximum breakpoint for a few items appears to be more nearly 100 dwellings. The one exception to this for a large cost item is appliances. However, even for these, purchase for about 50 dwellings per year can result in about half of the potential price reductions obtainable for as many as 600 dwellings per year.

Builders' Organization Types

The effect of scale on builders' site operations is by far the most complicated subject in this study. Detailed personal interviews were conducted with 34 builders in their offices. Their volumes varied from 6 units to 4,910 units, and they were located in 18 states.

There are upwards of 20,000 home builders in the United States. They have a multiplicity of organizational types, operate their building businesses in a multiplicity of ways, and engage in a multiplicity of businesses related to home building. Within the time and cost constraints of this study and within the limits of information obtained from the 34 builders and review of pertinent literature, the NAHB Research Foundation is attempting to present some generalizations pertinent to the effect of scale on builders operations.

In analyzing operations of the builders interviewed, there appear to be about five different types of organizations. For ease of reference, they have been designated as follows: The Craftsman Builder, the Managing Builder with a Small Staff, the Managing Builder with a Moderate-Size Staff, the Managing Builder with a Large Staff, and the Large Building Organization. Each type of organization appears to be capable of producing up to a certain number of dwelling units annually within a specified range. It is very difficult to generalize because there are a number of factors that influence costs and efficiency, and many of these are independent of scale and not subject to control by the builders. However, for the purpose of this report, there follows a brief description of the above-mentioned types of organizations.

1. The Craftsman Builder

The craftsman organization is capable of producing up to approximately 15 units per year. The craftsman builder does all of his ordering, specifying, and materials purchasing. He negotiates subcontracts for labor and materials for those trades in the construction process in which he does not engage. Generally, this builder has on his payroll two or three carpenters and one or two laborers, plus a part-time bookkeeper. This type of organization has a low overhead. It can purchase materials directly from local sources at negotiated prices that may be ten percent or more below retail list price.

For some of his operations, the craftsman builder may have a subcontractor supply both labor and material for reasons of economy or necessity. The subcontractor, because he works for several different builders, usually purchases more of that material annually than would any one small volume builder. Such volume purchases normally rate a discount, and the subcontractor in his quoted price for labor and material may pass at least some of this material price discount on to the builder in his bid.

2. The Managing Builder with A Small Staff

The managing builder with a small staff has an organization that is capable of building about 15 units up to about 70 units per year. Typically, such an organization consists of the builder, a supervisor, two or three carpenter crews, one or more secretaries, an accountant, and some have some type of sales organization. This organization typically builds in developments and is capable of producing housing units with sufficient variation to satisfy a general cross section of

the market for that specific area. The materials purchasing power of an organization of this size does not appear to be greater than that of the craftsman builder. In addition, it is burdened with a higher overhead per dwelling unit. However, this size organization can probably obtain somewhat better subcontract prices than can the craftsman organization.

3. The Managing Builder wiht a Medium-Size Staff

The managing builder with a medium-size staff may have an organization that is capable of producing from about 70 upwards to approximately 300 units annually. The builder-manager does the overall planning. His staff may consist of an office manager, who supervises secretarial and clerical personnel; one or more construction managers, who are in charge of field supervisors; working foremen with carpenter crews; some technical professional personnel; a sales manager, who oversees the sales effort; and an accountant.

Builders in this volume category are able to obtain some economies of purchasing compared to builders with lesser volume. They are able to obtain about lowest cost unit prices for most manufactured products and may be able to purchase sufficient quantitites to warrant direct shipments, for example, kitchen cabinets and appliances. In addition, they have enough volume to negotiate and obtain nearly best prices from local material suppliers. They can also bargain more effectively with subcontractors than can smaller volume builders.

4. The Managing Builder with a Large Staff

The managing builder with a large staff has an organization that is capable of producing annually from about 300 to about 500-700 units. The builder-manager is responsible for overall planning. In addition

to having the same types of personnel as the managing builder with a medium-size staff, he may have on his payroll a comptroller, project managers, a purchasing agent, and, possibly, a contract negotiator. He usually builds in more than one subdivision at any given time.

5. The Large Building Organization

The large building organization is capable of an annual production of approximately 500 to 700 or more units. Corporation principals generally do the overall planning. Under their direction are the personnel outlined in the staff of the "managing builder with a large staff" plus additional employees. The large building organization is usually developing several subdivisions at any given time and frequently builds in more than one city.

There are numerous variations of the above organizations. For example, one builder with an annual volume of 100 dwellings has twelve employees, including sales personnel. All his construction work is subcontracted.

On the other hand, another builder with an annual volume of about 180 dwellings has 105 salaried and hourly employees. This does not include salesmen who work on commission. In his operation, which includes about 40 separate corporations, most work is not subcontracted. He engages in many related businesses such as component fabrication, land development, real estate sales and management, insurance, subcontracting for others, etc.

Another builder produces about 400 single family dwellings and about 200 apartments annually. He has 80 employees and subcontracts all construction, except carpentry, cement finishing, masonry, and landscaping. He develops land (using subcontractors) and has his own sales organization.

There are at least two other methods of describing builders' organizations. In a 1964 NAHB survey, approximately 30 percent of the builders' organizations were sole proprietors, 59 percent had one or more corporations, 8 percent were partnerships, and 3 percent were a combination of the preceding, and "other."

A 1959 NAHB survey indicated that approximately 37 percent of all builders were primarily custom builders, about 43 percent operated as merchant builders producing dwellings for sale, and 20 percent of all builders used a combination of the preceding methods.

Builders' Operational Methods

Builders, within each of the above-named types of organizations, generally choose from two primary operational methods or select portions from each that best suit their purpose. Their choices are (1) Totally subcontract all labor and material, (2) Supervise all labor and purchase all material, or (3) A combination of (1) and (2).

1. Totally Subcontract

   Under this concept, subcontractors supply all material and labor and complete the task for a fixed, negotiated fee. In this case, the subcontractor is responsible for maintaining his records, supervising his crews, and meeting the schedule established by the builder. The builder, on the other hand, only has sufficient "production" employees to negotiate contracts, to schedule production, to make field inspections of work, and to pay subcontractors.

2. Supervise All Labor and Purchase All Materials

   Under this concept, the builder directly controls all labor and purchases all materials. Purchases are made directly from manufacturers, distributors or dealers. The builder may or may not warehouse materials for

distribution to each job. With this type of operation, the builder has a somewhat greater degree of control over the products used and the scheduling of the products to the site. However, he has substantially higher overhead costs related to materials acquisition and to labor supervision. In addition, he has on his payroll the entire labor force required to perform every task in the construction process. This method provides the builder with the potential to lower direct construction costs. However, he has considerably higher overhead costs that tend to offset the potential efficiencies of this type of operation. In addition, this type of operation is only possible in a stable market or in a variable market if the builder is able to maintain a stable volume. This type of operation inherently has a higher degree of risk than an operation wherin most of the materials and labor are subcontracted.

3. Combination of Above Two Types

Under this concept, the operation is similar to the total subcontract operation described above. The builder maintains some of his own crews and purchases some materials. The builder is most likely to maintain his own carpentry (both rough and finish) and concrete crews. However, this varies greatly and depends on the builder, local license and union requirements, and many other factors.

By far the greatest number of builders use this method of operation. For example, in the 1964 NAHB study referred to previously, 35.3 percent of all builders subcontracted 75 to 100 percent of the dollar value of their construction and 25 percent of all builders subcontracted 50 to 74 percent. In the 1959 NAHB survey, only 2.3 percent of all builders did not subcontract any construction and 3.4 percent subcontracted only 1 to 9 percent of their construction.

Other Operation and Management Factors Related to Scale

It appears that builders tend to engage in more activities related to building as their volume increases. These activities are quite varied and might include land development, real estate sales and management of their own and other properties, commercial and other construction, mortgage finance, materials dealerships and fabricators, and related businesses. Land development and real estate sales activities seem to be the most likely businesses builders will encompass as their volume increases.

As volume increases, it becomes necessary for the builder to build on multiple sites within the community. In any one community, almost regardless of the number of sites, there appears to be an upper limit to the percent of the market that any one builder can achieve. As volume further increases, there is a tendency for the builder to build in more than one city.

As volume increases, there is a tendency for the builder to diversify and build different types of structures, such as apartments, nursing homes, shopping centers, housing for the elderly, military housing, vacation homes, motels and hotels, and even office and school buildings, and public construction.

As volume increases, there is a tendency on the part of the large volume builder to rely on mortgage and insurance companies and commercial banks as sources of financing more often than small-volume builders use these institutions and to rely less on savings and loan associations. The larger-volume builders' financing operations are usually much more diversified. Large-volume builders use FHA and VA mortgage programs to a greater extent than do small-volume builders.

The large-volume builder necessarily tends to concentrate around major

metropolitan areas and infrequently engages in building custom homes.

As volume increases, there is a tendency to use more components. In the 1964 NAHB study, 25 percent of all builders used off-site fabricated components, while in the 1967 study referred to previously, 56 percent of the large-volume builders used some components. However, only 20 percent of the large-volume builders (200 units per year or more) stated that they used components extensively. The primary components used were roof trusses and prehung doors with interior and exterior wall sections, gable ends, and floor sections being used to a much lesser extent.

Effect of Scale on Land and Direct Construction Costs

Land

There follows some builder statements:

> There are economies of scale when purchasing prepared lots in volumes of several hundred or more at a time.
>
> There are no economies in scale in the purchase of raw acreage. It is better to keep cash liquid for purchase of land in "timely" markets and locations.
>
> There are economies of scale for raw acreage purchases for more than 100 houses if the land can be liquidated quickly; otherwise, no.
>
> From a negotiating standpoint, there are some economies in buying large tracts from one owner because fewer buyers can purchase.
>
> All things being equal, size of acreage purchased does not lower per-acre costs.
>
> Volume of acreage purchased does not necessarily reduce unit costs.
>
> Raw land costs are pretty constant (at a given time for a given locality) other things being equal, regardless of size of tract.
>
> The size of land area purchased does not change price per acre.

Lowest unit costs for land development are achieved by developing 50 lots at a time (600-dwelling-per-year builder).

Land development costs for 50 to 100 lots are estimated to be 8 percent less per lot than when developing fewer than 50 lots -- breakpoint about 50 lots.

Near-minimum lot-development cost is achieved by improving 20 lots at a time.

Most economical number of lots to develop at one time is 100 to 150.

Do not believe there is reduction in development costs per lot above 100 lots.

Best subcontract prices for sewers, curbs, and paving obtained for 50 lots or more.

Comment:

It appears that there are little, if any, economies of scale in the purchase of raw acreage. Although there are some indications that price per acre may be reduced with very large purchases, savings will be offset by taxes, carrying charges, and the profit-limiting effect of reducing working capital by investing in large quantities of land. The breakpoint for economic land development appears to be between 50-100 lots, and price reductions per lot for development for this volume compared to fewer than 50 lots may be in the order of 6 to 8 percent. There does appear to be economies of scale when purchasing developed lots in quantities of several hundred or more compared to buying a few lots -- but not necessarily compared to developing the land by the builder.

Materials

The price-quantity breakpoint relationship for materials as obtained from both manufacturers and builders is discussed at length in Section VIII. Prices of products depend on a number of factors other than

volume. There are some economies of scale with breakpoints generally appearing to occur at from 10 to 50 dwellings. The maximum breakpoint for a few items, however, is nearer to 100 dwellings, and there appears to be some price advantage for volume purchase of appliances up to perhaps 600 dwelling.

As volume increases, the builder is more likely to be able to purchase at lower unit costs, but he has higher overhead costs related to that volume purchasing activity. Savings in purchase price tend to be offset by costs for interest, inventorying, loading, unloading, handling, purchasing, accounting, and supervision. One builder (100 units per year) estimated that in volume purchasing and with his own warehouse facilities, he was able to reduce materials prices on the average about 20 percent compared to the small volume builder, but his materials purchasing, warehousing, interest, and related costs added 18 percent for a net advantage of about 2 percent.

Labor

There follows some builders' statements:

> We have kept accurate records of man-hour labor costs for 10 years and during that period of time have reduce man-hour content for similar houses nearly one-third, but have substantially increased our management overhead expenses related to achievement of that productivity increase. Direct labor costs as a consequence have remained almost the same per square foot of house during the 10-year period although labor prices have risen sharply. However, management overhead costs have increased greatly during the same period.
>
> Increase in volume does help to reduce unit labor costs, but it is necessary to increase costs for supervision and management.
>
> Increases in volume beyond 100 units per year do not reduce labor costs.

Increases in volume beyond 100 units per year formerly reduced unit labor costs, but this is not so today.

Increases in volume at least up to 1,000 units per year do not reduce labor costs appreciably.

Labor costs decrease up to a volume of 150 to 200 units per year (apartments), but added management costs tend to offset this.

Comment:

It is apparent that there are some economies of scale related to labor as volume increases to about 100 units per year, but that these are about offset by added supervision and management costs. On the other hand, very small-volume builders who personally supervise construction and work with their own crews probably achieve nearly equal efficiencies, and in some cases, perhaps higher degrees of efficiency than for some large-volume operations. It is well known that supervision, work planning, and scheduling importantly affect productivity. On a one-house operation, this is a relatively simple task. For a large-volume operation, it is much more complicated and not as readily achievable. Higher overhead costs must be incurred to obtain efficiencies as volume increases. Except for the very low-volume operation, volume in the order of 100 or more dwelling units per year probably results in near maximum efficiencies of labor utilization, other things being equal.

The primary method of developing labor efficiency, other than that due to scheduling, supervision, work planning, and related items, is through repetition. Hourly wage rates are independent of scale. Therefore, the only efficiencies or cost savings that can be developed as a result of scale are by improving productivity.

Industrial engineering studies by the NAHB Research Foundation show that the well-known (in manufacturing industries) labor-learning curve, is applicable to site construction and that repetition can improve productivity. This does not apply to normally highly repetitive tasks such as nailing and sawing, but does for sequence of operations, layout, measuring, and related items. The problem with repetition though is that market acceptance is limited except when appearance can be made different. Each time changes are made in appearance, potential efficiencies in volume repetition are decreased.

Subcontracts

It is inherently difficult to obtain comparative information on the economies of scale for subcontracting because, at any one time, builders almost always obtain subcontract bids for only a given volume and a given group of dwellings. Since no groups of dwellings are the same and costs vary with time, comparison of subcontract bid price variation with volume is subject to inaccuracies.

Builders interviewed who build from 50 to 100 or more dwellings per year, generally said that it was essential to know more about their subcontractors' businesses than they did in order to obtain the best prices. In general, builders seemed to agree that near-best prices could be obtained for subcontracts when volume was in the order of 50 to 100 dwellings per year. Two builders with volumes of more than 2,000 units per year differed on this point. One believed that subcontract prices could not be reduced above 100 units per year, and the other believed that nearly 600 units per year in one subdivision was necessary to achieve lowest subcontract prices.

As volume increases beyond several hundred units per year or so, it is sometimes necessary for builders to obtain several subcontractors for one type of work. This is because most subcontractors are not large enough to handle very-large volume and those who are, many times prefer to work for several companies simultaneously rather than for only one.

Effect of Scale on Other Costs

Indirect Construction Costs

By definition, indirect costs vary primarily with volume, but not in exact proportion to volume (This was noted in Section VI). Total indirect costs increase as volume increases, but the per-unit-indirect costs tend to decline as volume increases. However, these per-unit costs would be greater if the organization engages in direct materials purchasing and performs labor operations with its own crews rather than using subcontractors.

The relationship is not linear and there are discontinuities at the point where indirect costs are added but volume is not increased significantly. It is beyond the scope of this study to assess this numerically. The response of some builders interviewed indicated that the lowest per unit indirect cost might be for builders with either very small (under about 15 units per year) volume or for those with very large volume (over 500 to 700 units per year). However, others thought that near lowest or lowest per unit indirect costs could be achieved with a volume of about 100 units per year.

General and Administrative Costs

By definition, these expenses do not vary with volume for a given management operation and are frequently referred to as fixed expenses.

Their total cost does increase substantially as volume increases. The tendency is for the per unit cost of these expenses to decline as volume increases, but, again, this relationship is not linear and it has discontinuities. The determination of a numerical difference per dwelling unit as volume varies is beyond the scope of this study. It is believed, however that the per dwelling unit decline in these costs would be very modest as volume increases.

Marketing Costs

As volume increases, sales cost (commission or equivalent) may decrease slightly. Practices vary substantially, but as volume exceeds one hundred to several hundred units per year, sales cost may decline up to about one-half to one percent. Generally speaking, other marketing costs are dependent on volume. The overall tendency is for these costs to decline slightly as volume increases up to about 100 to 300 units per year. This cost may actually increase for very large volume due to the need for substantial advertising and model home expenditures.

Financing Costs

In general, financing costs are directly related to volume because money is loaned essentially on a yield basis. Under some circumstances, well-established, large-volume builders may be able to obtain slightly more favorable financing, but this would probably not be more than one-fourth of one percent except under unusual circumstances. Most of the builders interviewed stated that the cost of money was the same regardless of volume. A few builders said that this depended on the money market at the time commitments are made for interim and permanent financing, but that a slight advantage may exist with a large volume.

One builder estimated that during periods of tight money with accompanying high discounts (points), it might be possible for the large volume builder to achieve an advantage of one-half to a maximum of one point.

Overall Efficiencies

A number of the builders interviewed varied their volume substantially during previous years. Unfortunately, the price of land, the price of money, the price of materials, and the price of labor have constantly increased so it was most difficult for builders to make a judgment about comparative overall efficiency as volume increased.

Most builders thought that there were inherent efficiencies for the very small volume builder who has very low overhead and who personally supervises and participates in construction. His costs for materials are higher and this probably holds true for subcontracts. However, he probably has lower advertising expenses, may have lower financing costs (because of progress payment by owners for custom-built homes), and rarely has expenditures for items such as market analysis.

Most builders believed that there were overall efficiencies for annual volumes in the order of 70 to 100 or more units per year. There were differences of opinion about overall efficiency breakpoints above the 70-100 level. Some very large-volume builders thought that once a volume of about 100 units per year had been achieved in any one subdivision, there were virtually no economies in increased volume. On the other hand, at least one builder thought that it was necessary to achieve a volume of 600 to 700 units per year in one subdivision to achieve the maximum overall economies.

In most cases, builders interviewed stated that with their present overhead costs they could build more units per year if they could achieve increased

sales and that the maximum overall efficiency would be for somewhat higher number of dwelling units than they were currently producing. All were striving to achieve this additional volume. Stated another way, this means, that for a given size of organization, the maximum overall efficiency is achieved at the point just before the discontinuity in the unit-cost-related-to-volume curves occurs. (See Figure A) One builder who had built from fewer than 100 to slightly more than 500 units per year thought that the per unit overall costs might be reduced as much as 2 percent when building 500 units per year compared to 100 units per year. The market is the inherent problem, of course, for large-volume builders as they attempt to maintain production at maximum capacity without increasing their overhead.

If there were an unlimited market or a "standing-in-line market" as in many European countries, most builders thought that there would be added economies of scale for large volume production, especially, if a high degree of repetition were involved. They all recognize the design and environmental problems created by repetition of dimensions, materials, and appearances, yet, there are economies in such repetition.

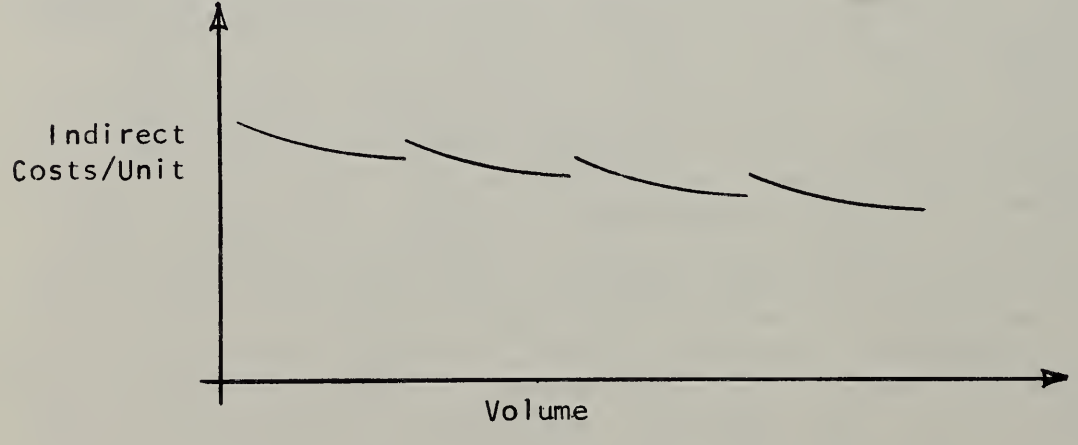

FIGURE A. Illustration of Discontinuities in Indirect Costs/Unit versus Volume Curve

METHODS AND CRITERIA USED BY BUILDING PRODUCT MANUFACTURERS FOR DETERMINING MINIMUM MARKET POTENTIAL NECESSARY TO INDUCE INVESTMENT IN NEW PRODUCT DEVELOPMENT

In answer to letters and follow-up conversations with NAHB Research Foundation, Inc., personnel, major building materials manufacturers provided information regarding their methods and criteria for determining minimum market potential necessary to induce investment in new product development.

The manufacturers were most helpful and cooperative in supplying information especially in light of the complexity of the questions and the very short notice given to reply.

There is sufficient uniformity in the responses to believe the information obtained is reasonably representative. Manufacturers replying represent a wide range in size and a broad variety of end products produced and raw materials used.

General

In the letters sent to manufacturers, questions were asked that related to markets for dwellings for low-income families in accord with the objectives of the study. This, and the use of the word "inducement" (per the contract) to invest in new product development, elicited some general comments.

It is apparent that manufacturers are well aware of the huge market potential related to low cost dwellings. Several stated that special inducement was not necessary to encourage investment in product development for this market. None is concerned with the potential volume. The combined potential of this market, the pressure of change, and the pressure to improve raw materials utilization and plant efficiencies to offset labor costs that are rising faster than productivity, are all more than adequate "inducement"

for these companies to invest in new product research and development. The key problem, as phrased by one respondent, is that "currently used products, materials, and systems are so low in cost that required price objectives for new products are frequently ridiculous".

In short, the inducements are present. The method of achievement is illusive. In commenting on this, one manufacturer philosophized that it is seemingly impossible to produce substantially lower-cost dwellings that look like higher-priced dwellings and that are built to the same standards of size, performance, and durability.

Methods

All of the methods used by these major manufacturers to determine whether they will invest in new product development may be described as sophisticated. Such determinations involve detailed studies and quantifications.

The following outline does not follow any one manufacturer's procedure, but it is intended to represent a consolidated outline generally representative of methods used:

1. Development of Product Concept

   This may come from an idea, a market need or a need of the manufacturer. Instant ideas that are successful are in the minority. Successful products are more likely to be developed as a result of a serious study of the needs of the market. Some manufacturers specifically try to develop products that will contribute to housing industry needs such as the lowering of on-site labor content, lowering of required site skill, lowering total weight, reducing the number of parts, pieces or layers, lowering cost, minimizing the effect of

bad weather, and similar items. Manufacturer needs may lead to product development as a result of studies related to excess capacity for certain lines, better by-product waste utilization, management decision to expand into new fields, or to expand existing volume of sales. This latter item appears to be a dominant factor in relation to new products stemming from manufacturer need.

2. Product Definition

Once an idea has been identified, an attempt is made to quantify the allowable price (and sometimes the allowable in-place cost) and the required performance.

3. Feasibility Study

A feasibility study is undertaken that considers the following items:

- Research and development time, cost, difficulty, and likelihood of research success
- Cost of production of product
- Potential market volume
- Methods and costs of distribution, advertising, and sales including special promotion requirements
- Requirement for invested capital and capital-in-use
- Conformity or lack of conformity with current plant facilities, skills, new materials, markets, and overall marketing and sales pattern of the company
- Special factors pertinent to the company

4. New Product Review Board

The feasibility study along with recommendations of either the research director or the new product development manager are submitted to a "new product review board". Personnel on this board typically consist of representatives of senior executives, sales, research and development, marketing, and production. A judgment is made as to whether or not to proceed. It is extremely difficult to summarize the judgment process since so many factors are involved. In essence, though, it reduces primarily to the question of potential yield on invested capital including capital to be invested in research, development, plant equipment, inventory, receivables, buildings, special sales, and promotion costs, etc. This is discussed in detail below under the heading of "Criteria".

5. Research and Development

If the product idea is accepted by the review board, technical research and development proceeds along with further refinement of financial estimates and much more detailed and comprehensive marketing studies. Marketing studies account for factors such as competitive products, permanency of the market, indirect competition, pricing trends for that category of product, degree of market assistance that can be anticipated from others, conformance with the strengths of the company, detailed market projections and degree of penetration, total dollar volume, evaluation of the sales appeal and value of the product,

effect of short- and long-term technical improvements that might affect the product, marketing strategy, time required to make the product profitable, profit prospects, customer evaluation of the product, and required sales and distribution patterns.

6. Interim Reviews

If at any time during the research and development stage, estimated research and development costs seem likely to exceed estimates by some fixed percentage (say 5 to 10 percent), new cost estimates are prepared and the board again renders judgment. If, at any stage of the detailed market analysis, significantly different results are obtained than were originally anticipated, the board again is asked to render judgment.

7. Pilot Plant

If all factors are satisfactory and the research is successful, pilot plants are established and production is initiated.

8. Commercial Development

The commercial development section or department, or its equivalent, begins test marketing of the product, and establishes advertising, sales, distribution patterns, and price.

9. Production

If pilot plant operation is successful, if production costs appear to be in line, and if test marketing is successful, production is either initiated or new

production facilities are constructed. An inventory is developed in the plant and in the distribution system.

10. Sales

Full-scale sales efforts are initiated. These include promotion, samples to distributors and users. In addition, a major effort is made to acquaint the market with the availability and the advantages of the product.

The above method essentially outlines the procedure for a "substantial" product development. Many minor improvements and changes in products are made without following anything similar to the above. One research and development director pointed out the fallacy of the old cliche about the world beating a path to the door of the man who invents a better mousetrap. He stated that regardless of how good the product is, substantial funds have to be expended to acquaint customers with the fact that the product exists and that it is better than some other products, and to convince them that they should change. Incidentally, the literature on management of research generally indicates that as much as 10 times as much money must be expended for promotion of new products as is spent for their research and development.

Criteria

There are a number of criteria applied by manufacturers in the process of judging whether to invest in new product development. In principle, the criteria are similar. Of course, there are variations among manufacturers and among different types of products for each manufacturer. In each case, there appear to be two criteria that dominate the decision within the specific limits established by each manufacturer. These are: (1) Likelihood of success and (2) Yield on invested capital.

1. Likelihood of Success

By one method or another, manufacturers determine the likelihood of success of developing a new product into a successful commercial reality. Some manufacturers reduce all factors affecting likelihood of success to a numerical basis and establish cut-off points. These cut-off points vary, but unless there is a 50 to 67 percent chance of success, the product idea will probably be dropped.

2. Yield

Return on invested capital or return on invested capital and on capital-in-use is a primary criterion for determining whether to proceed with new product development. In general, yield on invested capital for new products must be projected to be equal to or greater than average yield for the company. Higher-than-average yields on invested capital are sought because the effect of competition usually sets in quickly and causes yield returns to decay. Desired yields appear to be generally in two categories: (a) A lower rate for small-investment, low-risk compatible products, and (b) A higher rate for high-investment, high-risk, non-compatible products.

The above does not always hold, but it seems to be reasonably typical. If projected volume is large and the projected period of time during which the product may be expected to be competitive is long, the yield objective is reduced. If there are patent protections, the yield objective may also be reduced. In most cases, manufacturers commented that yield objectives on invested capital varied from 10 to 25 percent. In one instance, a yield of 2 percent on sales after taxes was mentioned for a minor modification or for a product completely compatible with the company's skill, production, sales, distribution, and raw materials.

Yield objectives for new products seem to be generally set above the average for the company not only because of the decaying effect of competition, but also because of substantial extra selling expenses for the first few years.

The project time required to recapture investment is an important factor related to yield. In the case of minor product modifications not protected by patens, a one- or two-year payout is desired. When there is patent protection and other protection such as a complicated production process and a large capital investment, up to 10-year payouts are acceptable.

3. Total Market Potential

The total market potential is a significant factor in the new product decision process. Here again, there are two general categories: a. For products that are highly compatible with the company's overall efforts and that have relatively low risk and relatively low investment, the minimum market potential is less. b. For products that are not compatible and risks and investment are high, the minimum required market potential is greater. Specifically, minimum stated market potential varied from about $50,000 annually to $50 million annually. The median was about one million dollars per year.

As in the case of yield, the effect of competition and resultant potential market decline, the effect of likely technological developments, the presence or absence of patent protection, the expected duration of market, and other factors affect the required market potential.

4. Required Capital Investment

In some instances, manufacturers have established maximum capital investment criteria which they generally do not exceed. In other instances, manufacturers have established minimum capital investments. In the case of minimum investments, a manufacturer will generally not consider the new product unless it requires commitment of at least his capital investment minimum. Some large companies with high overheads believe that it is uneconomic for them to try to compete in the marketplace with new products that require only small capital investment for production and relatively low levels of production, skill, and knowledge.

5. Competition

The effect of competition from other products over a period enters into the determination of required market volume. If the competition is expected to be quick and severe, a larger market volume potential would be necessary to induce investment in new product development. If the converse applies, a smaller market potential would be satisfactory.

6. Compatibility

If the new product is compatible with the marketing, production, and sales abilities of the company and compatible with their established distribution system, smaller market volume potential is required. For entirely different products that require different production equipment, different distribution systems, and new sales and marketing abilities, the required market potential volume is greater.

7. Patents

Except for minor modifications, some companies are reluctant to consider new product development that would not be protected by patents unless they involve large capital investments and complicated technical processes.

8. Other Factors

Other criteria are used in the judgment process related to new product development and necessary market potential. For the most part, these are not subject to quantification. Some manufacturers indicate that the sociological benefits of the product weigh heavily in the decision process. If the product will contribute to society, for example, aid in housing low-income families, the company would be willing to adjust other criteria. If the product will contribute to the prestige of the company, a lower market potential is required.

Summary

In summary, it can be seen that potential volume is by no means the sole inducement for new product development. Higher potential volume in all cases, though is a greater inducement. The likelihood of success and yield on invested capital and capital-in-use are the key factors in determining whether or not to engage in new product development. All companies emphasize that they generally have a broad and flexible policy and are constantly seeking to develop new products.

The dollar volume of required market potentials varies from small to substantial. For relatively small investments and for products that are compatible with the company, market potentials for the companies' products

in one to five thousand dwelling units per year are indicated. For products that are not now compatible with the company and that require high capital investment, as many as a 50,000 to 100,000 dwelling unit market potential for the companies' products might be required as an inducement to proceed. The above statement of required markets in terms of dwelling units per year is highly variable and depends to a very large extent on the dollar value of the particular product. As the dollar value of the product in one dwelling increases, the required number of dwellings decrease.


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