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Over the years families have often adapted to available housing space instead of adapting spatial arrangements to particular needs of family members. New concepts of space use and alternate spatial arrangements in the home are often necessary to meet overall human needs.

This study was undertaken to present information on the conversion of under utilized spaces in the home such as garages, porches, attics and basements into family living spaces. Pertinent literature relating to space planning and home improvement was reviewed. A survey was made of current space conversions in the Winston-Salem, Forsyth County area.

Information on family space needs and the methods and considerations of gaining more living space were summarized. A slide series with accompanying script was developed as an educational aid.

SPACE PLANNING FOR CONVERTING UNDER UTILIZED AREAS OF THE HOME INTO FAMILY LIVING SPACE

by

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APPROVAL PAGE

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CHAPTER I

STATEMENT OF THE PROBLEM

Background of the Study

Currently over 60 percent of American families own their own homes (19:1; 20:18). More American homeowners than ever before are remodeling and improving their residences. Only a decade ago, the average price for a new home was around $20,000. In 1971 it was $28,000 and by 1976 it had risen to over $50,000 (20:18). Although growing families are faced with the need for more space, staying in one's present home in a stable neighborhood and expanding or rearranging the existing spaces has become increasingly advantageous to the American family. Statistics from the United States Department of Commerce, Bureau of Census show that in 1975 residential property owners spent $15.5 billion for additions, alterations and major replacements to the home (25:1).

If the home is basically sound, the homeowner finds that it is wiser to finish paying off a vintage mortgage with a relatively low interest rate than to seek a new home with a high cost mortgage. Selling out usually entails sizable, non-returnable expenses such as closing costs, title search, title insurance, legal fees and often brokers fees (7:15). Families remaining in their present homes can use the same amount of money for a financial headstart on improving and converting existing spaces (26:5).

Research in 1975 by the National Census Bureau and the Bureau of Building Market Research indicated that over 50 percent of the money spent on alterations and improvements to homes was spent on do-it-yourself projects. Homeowners are converting existing under utilized spaces such as porches, breezeways, garages, basements, and attics into living spaces. These areas are the least complicated and inexpensive to convert. The roof is there, as usually are floor supports, and sometimes basic walls and wiring. With the addition of plumbing, adequate walls and wiring, heating or cooling systems and space arrangements, more living space is made available (28:1). New additions to a home, such as attaching a new room to the exterior, can require the redesigning or reconstruction of the existing dwelling (28:2).

According to Tessie Agan, family space needs change during the life of the family and the average family finds it difficult to occupy the same dwelling throughout all the periods of the family life cycle. It is possible, if the space in the home is well planned (1:354).

During the stages of the expanding family and the launching family, there are increased space demands on the dwelling. It is during those stages that the family might seek a more commodious home or make plans to remodel the old one (1:20).

On October 23, 1976, the New York Times Business and Finance Report indicated that based on the 1976 new home prices

and the current average salary levels, more than one-half of American families cannot afford a new home, and in fact, perhaps many could not qualify for a mortgage if they wished to buy the homes they presently own at the current price levels (20:18). With these facts in mind, more research is needed to aid American families during the current living space crisis. Help is needed to better preserve and utilize what the family already has in the form of housing.

Sir Winston Churchill could have been speaking to the modern American family when he said, "We shape our buildings and afterwards they shape our lives" (26:4). To better convert under utilized spaces in the home the family should begin with a well planned design. Just as our national resources and energy sources need long range plans for preservation and better utilization, so do our living spaces (6:6).

Purposes of the Study

The purposes of the study were as follows:

1. To assemble information on the conversion of existing under utilized space in the home to living spaces.

2. To present the nucleus of these findings in an accompanying slide series with script to be used by designers and laymen interested in space planning and home improvement.

Definitions of Terms Used

Ampere. The standard unit used for measuring an electric current.

Dormer. A window pierced through a sloping roof and placed in a small gable which rises in the sides of the roof.

Muntines. Vertical pieces separating panels of glass held in a frame.

Open-Plan Living. A house design incorporating the living room, dining room, and kitchen into one large open area in which activity areas may be partially separated.

Proportion. The relation of one portion to another or to the whole, balance or symmetry.

Scale. The size relationships between parts or between parts and the whole.

CHAPTER II

REVIEW OF LITERATURE

Family Space Needs

At the beginning of the Industrial Revolution when masses of workmen moved from their small dwellings to newly created industrial centers, efforts were made to set up space and occupancy standards which would govern rental practices and building permits (4:5). The American Public Health Association set up standards of living spaces stating the minimum space allotments per person in terms of square feet of floor space. In some parts of the world these specifications are known as floor space rate, i.e., square feet of floor space per person. These norms take into consideration both living requirements such as area required for standard size furniture and equipment and space needed for their use and health requirements such as minimal distance between beds. These standards are concerned more with function than privacy and are therefore independent of subdivisions into rooms. These standards are as follows (4:6):

1 person - 400 square feet

2 persons- 800 square feet

3 persons- 1000 square feet

4 persons - 1200 square feet

5 persons - 1450 square feet

6 persons - 1550 square feet

Total space requirements increase consistently with increase in household size but at a slower rate; however, on the basis of square feet per person they decrease. This implies a higher rate of utilization of space as the size of the household increases, due in part to certain spaces being required for the operation of the household such as for food preparation, laundry, cleaning, and operation of utilities. Space requirements for these activities remain constant, regardless of the size of the household. Thus, as the household gains in size the greatest demand is for extra space for bedrooms and social activities, while the utilitarian part of the dwelling meets the extra demands for space through more efficient utilization or by a relatively small expansion (4:48; 18:13).

An American Public Health Association publication (4:5) indicated that frustrations within the family often occur from overcrowding. Conflicts often arise between the desires and needs of various members of the family due to the performance of household duties under unfavorable conditions. Nurses and social workers reported that overcrowding and frustration in a congested household cause stresses as real as those produced by overloading a building column.

The American Public Health Association study recommended that the home provide space for social activities of the family as well as spaces to permit privacy both within the family and from the outside world. This recommendation was also made by Schlater in 1970 (23). The home has a potential contribution to make to the social life of the family. Providing private and social spaces helps to control tensions arising among family members. Companionships may be limited or fostered through the provisions made for shared group experiences such as games or simple conversation (4, 18).

In Nebraska in 1961, Withrow and Trotter conducted a study on the space needs for leisure activities of teen-agers. Thirty homemakers who had at least one child enrolled in junior or senior high school were interviewed to obtain information on the types of leisure activities, frequency of participation, site of activity, equipment used and its place of storage. The activities that were carried on by more than 20 percent of the group were classified as follows (30:359-362):

Social	Active	Quiet or Private
Guests for meals	Dancing	Study
Guests for snack	Painting	Reading for pleasure
Guests for cards	Carpentry	Radio
Guests for visiting	Games	Television
Quiet games	Sewing	Model cars
Music		
Television		
Radio		
Handwork		

Some of the activities listed that were most frequently carried on by teen-agers with their guests in the living area of the home were playing cards, dancing, visiting, listening to music and eating. Activities with teen-agers involving family members in the living area of the home were: watching television, reading, listening to music, games, handwork and photography.

Activities that were participated in by both teen-agers and parents, but in different locations, were:

Studying	- bedroom for teenagers - kitchen for parents
Reading	- bedroom for teen-agers - living area for parents
Listening to music	- dining area for teen-agers - living area for parents
Photography	- living area and basement for teen-agers - bedrooms for parents

Mary and Russel Wright in Guide to Easier Living (31:24) suggest that the living room is overburdened in the American home. Where space and budget permit, auxiliary living areas should be planned. It is deemed advantageous for a mother with children to have a daytime living room that incorporates a play area and laundry center. A leisure area could be found in the bedroom and hobby areas in attics, basements or any unused space.

If two living areas are possible, Wright suggests that they be utilized as a quiet room and an active room.

A quiet room is needed for such sedentary pleasures as reading, listening to music, conversation and perhaps bridge. Soft carpets and a workable fireplace are suggested.

The active room should be modeled after a gymnasium with provisions for more strenuous leisure activities. Such a room can provide real warmth and life with space for ping-pong, pool, photography, dancing, crafts or painting with one corner set aside for television or lounging or snacking (31:24-26).

According to Agan, it is in the domestic or home experience that provisions for rest and privacy should occur giving a family member a sense of peace and inner strength that are necessary. This was also noted by Schlater in outlining goals and guidelines for improving man's near environment (23), and by Compton and Hall in Foundations of Home Economics Research: A Human Ecology Approach (6). These authors agree with Agan that privacy has become a recognizable need in the twentieth century, not as it was for centuries, the luxury of the well-to-do, but a need of the humblest worker. Today with congestion characterizing the housing facilities of most cities and suburbs, with rapid transportation, television, movies and radio, leading to numerous contacts sometimes not of the family's mores, the very pressures of the numerous conflicts of the fast moving world make provisions for privacy of prime importance in home planning. Edward Hall in The Hidden Dimension observed that the use of

personal space can affect all phases of many cultures both now and in the future (12).

Agan cited the National Conference on Family Life as designation of the periods of family life as the beginning family, the expanding family, the launching family, the middle-age family, and the old-age family (1:351). During the stages of expanding family and launching family there seems to be more of a demand on space in the home. Agan reported that during early adolescence, children are at the most restless and boisterous period of life. They still spend a lot of time at home during the pre-teen and early teen years. This age child needs space for privacy and for social activities of his own. This was also noted by Withrow and Trotter (30). At this period of family life the husband is usually at the busiest period of his career and may want a quiet place to study, bring his friends, or retire with his wife from the activities of the children. As a result of the increased demands on the dwelling at this stage of family life, the family usually seeks a more commodious house or may remodel the old one if already owned (1:20).

Bruno Zevi in Architecture As Space reported on space planning in the home. He stated that although we may overlook it, space affects us and can control our spirit; a large part of the pleasure we obtain from architecture, pleasure that seems unaccountable, or for which we do not trouble to account for, springs in reality from

space. To enclose a space is the object of building and when we build we but detach a convenient quantity of space, seclude it and protect it; all architecture springs from that necessity (32:217).

Charles Eames has said that architecture has been aptly referred to as "space enclosed for a reason" and interior design might well be called "space enclosed for living." The space enclosed literally shapes our lives. In cramped or poorly planned space, family frictions develop, tensions find no release. Adequate, efficient space is no guarantee of successful home life but it contributes toward that goal. He also stated that the ability to enclose space inexpensively has seldom been more acute than today and that we should make the spaces we now have as effective as possible (9:130-132).

Julius Panero in Anatomy for Interior Designers noted the fundamental measurements of space needed for the average person to function at different activities throughout the home. He reports that the space arrangements in the home tend to be allocated for two uses — specialized and general. Special uses include activities like cooking, sleeping, and bathing. General use tends to center in one room, the living room. There, lounging, listening, conversation, reading and visiting take place, along with the viewing of television. Because so much activity takes place there, it has been allocated the most space of any room in the house. As the family grows, this is the area of the home where the most space is needed (18:13).

To gain more living area in the general area of the home the theory of open plan living was developed. The theory of open plan living is to build as few permanent partitions as possible to separate visually the dining area from the main living section as well as to give access to patio and garden in a free flowing of space. One of the arguments against the open plan has been the lack of privacy for the family (18:14). Perhaps the open plan is better for certain periods of the family life cycle and inadequate for others, especially for expanding and launching families (1:351).

A few basic space needs in the family cited by Panero (18) are as follows:

Arc of conversation: distance from back of chairs in which two people sit facing the other and converse comfortably . . . . . 8'0".

Space required for one person to sit upright in a chair . . . . . 2'4" by 3'0".

Ceiling height for adequate headroom. . . . . 8'0".

Circle of six chairs around a round coffee table for conversation with leg room and passage. . . . .10'0" by 10'0".

To provide space for four people playing cards at a round table in a corner of room . . . . . 6'11" by 6'11".

A living-dining room treated as an integrated unit with table in the corner. . . . . .23'0" by 16'6".

An arrangement for a room with piano so audience might see and hear. . . . . .13'0" by 9'6".

The Committee on The Hygiene of Housing summarized space required for sleeping, dressing, recreation and self improvement for one to six persons in the family as follows (4:20, 29):

Space Recommendations by Number of Persons in Household

	Number of Persons					
	1	2	3	4	5	6
For Recreation and Self Improvement						
	Square feet					
Furniture	53	67	79	100	118	129
Storage	6	9	12	15	18	21
Activity	66	88	130	171	221	233
Total	125	164	221	286	357	383
For Sleeping and Dressing						
Furniture (excluding storage units)	28	56	84	112	140	168
Storage space	12	24	36	48	60	72
Activity space	34	68	102	136	170	204
Total	74	148	222	298	370	444

It is recommended that families who plan to convert basements into activity areas for playing pool or table tennis allow plenty of space for the equipment needed and enough space for movement around the tables. A professional pool table is 4-1/2' 0" by 9' 0" and about 14' 0" by '8' 0" is needed for playing space. A family size table is 4' 0" by 8' 0" and requires less playing space because of shorter cues. A regulation table tennis facility is 5' 0" by 9' 0" and 5' 0" is needed at each end with 4' 0" on each side for playing space (13).

Gaining Living Space

Studies have shown that as the family increases in size the greatest demand is for extra space for bedrooms and social activities. Space needed for the operation of the household such as food preparation and laundry, remain somewhat constant (4, 1, 18). With this in mind, the following review of literature will concentrate on those living spaces in the home needed for rest and leisure activities for growing families.

In 1955, President Eisenhower foresaw a shortage in housing space because of the short supply of mortgage money available. He urged members of the building industry to take up the slack in the need for living space by expanding the market for remodeling. The slogan became "Fifty-six the year to fix." Homeowners throughout the country responded to that message and spent eight billion dollars, the largest expenditure for maintenance, repair and home improvement to that date. Operation Home Improvement, OHI, was born and from that has sprung the National Home Improvement Council which today is one of the largest organizations incorporating building material manufacturers, national organizations partially dependent on the home improvement business, shelter oriented consumer magazines, and nearly 1,800 contractors, dealers, builders and local suppliers throughout the United States (17:4).

In 1975 a study was conducted by the Bureau of Building Marketing Research in cooperation with National Family Opinions, Inc., to provide an overview of the dimensions of homeowner's remodeling and modernization activity. The study reported that homeowners accomplished 3.2 million room additions from the spring of 1974 to the spring of 1975. A room addition was defined as porch and breezeway enclosures, exterior room additions, finishing off and converting attics and basements into living areas. Fifty-five percent of these were accomplished as do-it-yourself projects by the homeowner and accounted for thirty-five percent of the dollars spent. The highest incidence of conversions occurred in families with head of household in the 30 to 40 year age group (5:9, 32-36). The average annual remodeling, modernization expenditure generally varied between 1 percent and 2 percent of the total home value depending on the age and value of the home (5:1). Homeowners with incomes within the $10,000 and $20,000 income bracket accounted for 80 percent of the total expenditures for conversions. A United States Department of Commerce survey reported comparable findings (25:1).

Basement rooms were reported as the most popular room conversions and three-fourths were done as do-it-yourself projects without professional assistance. Over one-third of the owners were willing to add an exterior room addition without professional help (5: 9, 32). Porch and breezeway enclosures were most popular

among lower income families who lived in lower priced homes. Basement rooms were most frequently added by families in the upper middle income group who lived in higher priced homes. Exterior rooms were completed most often by upper middle income, middle aged families but were added to homes at all cost levels (5:32).

Over two-thirds of the respondents in the survey were satisfied with their work and plan to do more do-it-yourself projects in the future. Almost one-third intend to do major remodeling jobs within the next two years. Only one out of ten intends to move to another home (5:9).

Another report issued in January of 1975 titled, "Maintenance, Repair and Remodeling; The Growth of the Building Industry" (17:1), indicated the trend of the American family seeking needed space, to remain in its present home and convert existing under utilized spaces. It states that growth in expenditures for repair and remodeling is expected to accelerate from 6.5 percent during the last eight years to perhaps 9 percent annually. These predictions were based on the following trends:

1. The growing population, more family formations, and increasing family income.

2. An aging housing stock that will demand increasing maintenance.

3. Rising costs for service and repair.

4. Increased costs of new housing and shortage of mortgage money.

5. A more sophisticated and effective distribution system.

6. Product innovation.

7. Possible legislation to provide tax incentives for home improvements.

8. Energy conservation.

Edward Gerber, Director of the National Home Builders Association Rehabilitation and Remodeling Department reported that the market for converting spaces to conserve energy is enormous. It seems that as the American homeowner experiences the dramatic rise in the price of home heating fuels is he motivated to better insulate his attic and basement. In the process of adding insulation, he becomes interested in converting those areas to family living space (11).

Considerations When Converting Space

Condition of the Home

Before a homeowner pressed for more living space decides to invest time and money into converting space in his present home he should examine the condition of his home carefully, especially if it is an older home (13). There are checkpoints suggested for inspecting a home to decide whether to remodel, get more advice, or move (13, 7).

The Roof and Foundation. If the homeowner uses a ruler or straight edged object as a sighting device he can check the roof line. A noticeable sag in the roofline may mean a serious problem such as a weak foundation. In a masonry house, bulging walls, uneven house corners or sagging window headers (horizontal timbers above the window) could mean weak walls with a foundation that is starting to crumble (13).

The Basement. A check of the outside basement walls should be made to determine if termite mud tunnels are present. After a rain, cracks in concrete walls should be checked to see if moisture is seeping into the basement area. If so, the walls should be waterproofed (13, 26).

Outside Paint. Peeling on the outside of a frame house may mean poor ventilation in the walls and retention of moisture. If new siding is applied over unseen moisture, damage will occur and fresh paint will peel. The source of the moisture buildup should be discovered and corrected (26, 22).

Wiring. Amount of amperage should be checked. A house of eight or more rooms needs a 150 ampere service, in most cases. If resistance-type electrical heating is used, 200 ampere service is desirable (14). The home wiring system should conform to the requirements of the National Electrical Code, local building codes, and the utility company furnishing the power. Equipment grounding

should be provided for appliances and outlets in damp or moist areas. This is important when working with basement conversions. Houses built after 1962 were required by the National Electrical Code to include grounding receptacles throughout the house (14:8).

Neighborhood. The homeowner should beware of over improving a home. He shouldn't invest $50,000 in a home in a neighborhood of $25,000 houses, unless he likes his home so well that he plans to live there permanently and is willing to risk a loss on his investment if he has to sell. Dowd (7) advised against spending money on improvements in order to increase the resale value of the home, but believes that if the homeowner lives in a small home on a large lot surrounded by larger and more expensive homes, adding more space and bringing the home size up to the size of the others is very desirable and should help in recouping the investment should he decide to sell (7, 26).

Local Building Codes and Permits

All elements of a home improvement job must conform with local building codes. It is the homeowners' responsibility to know local regulations before making any structural changes in his home. Zoning laws and rules on building permits vary from town to town even within the same surburban areas (13, 7:249). In Pittsburgh, for example, to close in a front porch often takes a zoning hearing. In Atlanta, a code requires that 65 percent of the area in an attic must have 8 feet of head room before it can be used as "living space."

Few attics qualify (13). If the homeowner has an unfinished area and partitions a segment and completes a new room, he would need a building permit in most localities. He has changed the basic amount of living area in the home from storage space to livable space. It is necessary for the homeowner to check with the appropriate town offices to secure the needed permits before any construction begins (13, 22, 7).

Financing Conversions

Money put into added space in the home is an investment. The increased value of the home after adding more space often exceeds the cost of remodeling (7).

Robert Schraff who has completed over one hundred books on home improvement over the last twenty-five years has suggestions for the homeowner on financing home improvements. He notes that few homeowners have enough money to finance a major home improvement and even if money is available, there are sound reasons for not disturbing a family's savings account (22:3). "Pay-as-you-go" financing is usually feasible for small scale home improvements, but on larger projects it tends to drag the job out which might result in additional costs as prices increase in an inflationary economy. Where major improvements are planned involving a large expenditure for plumbers, electricians, carpenters, and painters, easy monthly financing is often the best answer. Various financing plans are

readily available to property owners with steady incomes or established assets (22, 16). If the homeowner has major outstanding debts, this may affect his borrowing power (22).

Banks and Savings and Loan Associations are logical sources for home improvement loans. Other alternatives should be investigated such as borrowing against a life insurance policy or from a company credit union. If the homeowner has an established savings account, many leading institutions have a procedure enabling the homeowner to borrow his own money for a very low rate of interest (10:5).

The Federal Housing Administration Office (FHA) will provide the homeowner with information on the local lending institutions which offer FHA Property Improvement Loans. The Title I plan enables the qualified homeowner to borrow $5,000, with 5 years to pay; Title II plan is devised for improving homes over ten years old (22:3, 4).

To obtain most loans, detailed descriptions including plans and specifications of the proposed improvements, plus a realistic estimate of the cost are needed before the lending institution can act on the application (22:5).

Planning the Labor

The homeowner armed with the decision to make a home improvement and the money required to do the job must make up his mind to do the work himself or hire someone else. He might choose to let the professionals do the basic work and do the less complex work himself (7:219).

Previously noted studies (5:1; 25:1) report that more people are doing the home improvement jobs themselves. The homeowner wishing to add space to his home can find many sources of available help. Adult evening classes on home improvement are held at high schools, technical schools and city colleges, with low entrance fees. Courses in carpentry, plumbing, masonry, tiling and electrical work are taught. These classes often teach not only job techniques but also how to select materials and plan costs. New product improvement is also a factor enabling the homeowner to do more do-it-yourself projects (5, 10). The general quality of books for the do-it-yourselfer has improved in recent years. Illustrations are clear-cut and instructions simplified.

The easiest but more expensive way to get a home improvement job done is for the homeowner to hire a general remodeling contractor to assume the responsibility of the project (22:7). It is not advisable for the homeowner to be his own contractor. This was a feasible alternative several years ago, but today, because of material shortages, the chore is more difficult and can prove more expense in the long run. The best approach is to check with bankers, lumber yard owners, building inspectors and architects for names of reliable contractors who do space conversions. Take several bids and before selecting the final contractor, arrange to talk to previous customers to find out if that contractor completed his job satisfactorily for the price agreed

upon, within a reasonable time (22:7). To find if the contractor is in financial trouble or fails to pay his bills, check his local credit rating (22:8; 13).

All business arrangements between the homeowner and the contractor relating to the actual construction as well as responsibilities and method of payment should be put in writing (22:8; 9). It is a good policy that money should not be paid, or workers should not enter the home, until a contract is signed. A time for completion should be agreed upon, but because of material shortages contractors are apt to shy away from firm dates. One month from start to finish is reasonable for most interior space conversions, although major jobs may take 90 days or more (13, 22).

Planning and Designing New Spaces

When new living spaces are to be planned for the home, the entire family should confer, making notes as to the desired end results. Once the basic ideas are in mind the family may consult with an interior space designer or an architect. Either will draw up clearly specified plans and will work with the homeowner or the contractor (26:11; 10:4; 2:56; 24:16, 18).

In planning new spaces in the home and in any home improvement, nothing is more important to the success of the result than the preservation of the original proportion and scale, or the creation of good proportion and proper scale where they did not exist before. Good

proportion and consistent scale are as vitally significant in the small house as in a larger dwelling (8:54).

In the planning stage of space conversion, it is essential to have plans and elevations of the proposed changes drawn accurately to scale so that every feature appears in its true relation to every other feature (8:54-55; 26:11).

Eberlein and Tarpley in Remodeling and Adapting the Small House reported that sometimes homeowners think that any rough, hastily drawn plan by the carpenter, often not drawn to scale, will answer the purpose unless the alteration is extensive. Plans or sketches not drawn to scale are misleading and invite miscalculations and costly mistakes (8:55).

One should note proportion and scale in the placement of windows when enclosing new spaces. Windows played an important part in the design of many traditional homes such as Colonial or Georgian styles; they were usually symmetrically arranged across the front. In converting space, it is often impossible to disturb the arrangement of windows without throwing the whole scheme out of balance. When placing new windows in a newly added space, the homeowner should consider placement, size of window, size of panes and dimensions of muntines. All of these have significant bearing on the scale of the composition (8:55).

When attic conversion is planned and dormers are to be added particular attention should be paid to their form and placement. Here again proportion and scale should be respected (8; 22:424). If possible, the best placement of the dormers is on the back side of the roof of the house (22:424). However, if they face the front, they should avoid a "stuck on" look. One device advised by Eberlein and Tarpley is to splay the dormers to make them less conspicuous. Splayed dormers are less conspicuous than peaked or gabled ones. For the sake of appearance the old shingles and siding materials should be matched.

Another point to consider when adding new spaces is the placement, height, dimension and contour of chimneys if they are to be added. New chimneys need to be in scale with the rest of the structure.

In conversions, consideration of proportion and scale extends to the materials of which the original house was built. If possible, new materials such as bricks, shingles and siding should correspond with the original materials in proportion and scale (8). Special attention should be given to new doors. They also should agree in proportion and scale with other exterior doors (8:59; 29:649).

Consultation with a trained space designer will help the homeowner in the planning stage of a major home space conversion. Trained interior designers and architects can make a major

contribution to home improvement plans, and sometimes even repay the fee charged in terms of construction savings (26:11). The trained designer can arrange the spaces in proper proportion and scale and prepare the plans, suggest materials and appropriate paints.

Mary Jean Alexander, former chairman of the National Association of Interior Designers Committee on Education reported that in developing the floor plan, furniture arrangement, floor, wall, and window treatment and decoration, all should be coordinated with the architectural design. Results are best when the interior designer works with the contractor. Questions that should be asked of the family in the planning stage include: What will the family be doing in the various spaces? How does one want to feel in each space and in moving from one to another? What does he wish to see or hear? What does he want others to see or hear? What relationship is wanted between adjoining space, privacy or ease of communication? Should they appear separate or connected, alike or contrasting (2:57)?

Alexander and Siegel (2:56, 24:16) have suggested that the professional designer should follow four basic steps:

1. Formulation of the job requirements or clear statement of the design problem.

2. A schematic, graphic representation of the requirements without regard for dimensions, but indicating proposed space relationships and traffic from space to space considered both functionally and esthetically.

3. The design development phase, in which sketches or models and necessary samples are used in working out all facets of the design.

4. The final presentation to the client.

CHAPTER III

PROCEDURE

Review of Research

Pertinent literature relating to family space needs, the converting of space in the home, home improvement research and the designing of space in the home was reviewed. The Jackson Library of the University of North Carolina at Greensboro, the libraries of North Carolina State University at Raleigh and Wake Forest University, and Forsyth County Public library in Winston-Salem were sources of literature. The educational service of the National Home Improvement Council was contacted. The United States Department of Commerce in Washington, District of Columbia, and the North Carolina State Extension Bulletin Service publications were researched.

The literature and research were reviewed and compiled into four major divisions which were: family space needs, gaining living space, considerations when converting spaces and the planning and designing of new use of space. The pertinent information from the review of the literature was summarized in each division. This information was then used to develop a slide series with accompanying script.

Development of Slide Series

The slide series was developed from a survey of space conversions completed by Winston-Salem-based home improvement contractors within the last three years; do-it-yourself home improvements were also reviewed and conversion projects designed by the researcher and interior designers in the Winston-Salem, North Carolina area. Projects were limited to conversions of attics, porches, basements and garages. Those selected for illustration were based on the following criteria: good design features, adequacy in meeting needs of the family concerned and inclusion of multi-use spaces.

The findings from the review of literature indicated that the homes chosen should be of two basic styles: colonial, representing the early 1900s, and ranch homes built after 1960. Houses in all price ranges were included. The conversion work to be illustrated was completed by home improvement contractors and by the homeowners. The planning and designing to be included was completed by contractors and interior designers or by the homeowner. The series was planned to emphasize the important considerations to be noted in conversion of space in homes according to individual needs of the family in each conversion project.

Most of the slides used in the series were made using a Canon camera with a 40 mm lens and high speed Kodak Ektachrome film

with an electronic flash adapter. A Kodak Instamatic X-15 camera using Kodak Kodachrome film was used for some of the exterior slides. Floor plans were photographed with a 35 mm camera which was mounted on a copy stand. The exposed film was developed into slides by the Kodak Processor, Atlanta, Georgia.

CHAPTER IV

SLIDE PRESENTATION

In order to fulfill one of the objectives of this study, the slide series and script were developed from the information recorded in the review of the literature and from a survey of space conversion projects completed in the Winston-Salem, Forsyth County area within the last three years.

The script was numbered to parallel the slide presentation. The following is commentary developed to accompany the slides.

Converting Spaces

Slide 1. Today the average price of a new home built to fit the space needs of the typical family is over $50,000. As families grow and need more living space most cannot afford to move to a new or larger home and are faced with looking around their existing homes for space that is not fully utilized.

Slide 2. Many ranch style homes built after World War II have basements with an area equal to that of the first floor and attics with almost one-half of that area.

Slide 3. Often older two story homes have attics with high ceilings and large porches which provide ideal space that could be converted into family living space.

Slides 4 and 5. Many attics and basements are used as storage areas, cluttered with unused items that could be thrown out. Often if storage areas were organized and items that are not being used are removed, the area remaining can be converted into family living space.

Slide 6. In warm climates, garages are not always needed for storing the car. If a family is facing a space crisis, the garage space might be better utilized as family living space. In this situation a garage was developed into a 2 bedroom house for the grandparents.

Slide 7. In the following homes, located in Winston-Salem and Forsyth County, North Carolina, families have solved their extra space needs by converting under utilized spaces in their homes to family living area.

Slide 8. A family of six with four teen-agers living in this home needed more space for family activities, entertaining friends, and pursuing hobbies.

Slide 9. A dry basement area with workable fireplace had been left unfinished when the house was built. It was used for storage and as an area to play pool. The entrance to the basement was near the center hallway, making it easily accessible for family use. An adequate overhead space of seven and a half feet was available after existing pipes and ducts were boxed in. The area converted would add over 550 square feet of living space to the home.

Slide 10. An interior designer was consulted to help with the space planning, lighting, color scheme and choosing of materials. To save on construction costs, the members of the family planned to pool their talents and do most of the work themselves, including some of the plumbing and wiring.

Slide 11. The floor plan drawn to scale, provided a guide for the family to follow in constructing various areas of the room. Spaces were planned for music, games, sewing, television, seating, storage for hobbies, a bar-kitchen, and one-half bath. The area in the center of the room was left free for traffic flow and dancing.

Slide 12. One family member had salvaged an old telephone booth to be used in the new room. It presented a space problem which was solved by recessing it into the wall. With its own interior light, it provided an excellent place for a teen-ager to place calls in privacy.

Slide 13. To save on floor space and cut down the costs of plumbing, the bathroom and kitchen-bar areas were planned to back up to the plumbing pipes from the first floor. These were under the staircase next to the back wall.

Slide 14. The storage closet in the bath is located under the staircase and holds photography and dark-room equipment and a wine-making kit.

Slide 15. The seating area was placed near the bar-kitchen and the seating was built in to save space. The television, located behind

the bar on a swivel base, is visible from the seating area. Storage drawers were built in the base under the seat cushions to hold games and books. Cove lighting is located under the shelves built over the seating area.

Slide 16. The piano was placed against the well-insulated wall with cabinets built on the side for the storing of records and stereo equipment. The speakers for the stereo were placed on the ceiling behind the beams to save space.

Slides 17 and 18. On the north side of the room, under an outside window, a sewing area was planned. Cabinets were built for the sewing machine, fabrics, ironing board, and all the other equipment needed for sewing. A foldaway cutting board, which fits over the pool table, is stored in a special cabinet.

Slide 19. Two windows on the outside wall opened to a dark crawl space under the porch. They offered little light and a very unattractive view. It was decided to utilize these windows as an art object. Two stained glass windows were designed in harmony with the English Pub decor of the room. To emphasize their colors, flourescent tubes were installed in a cove behind the windows.

Slide 20. In constructing the walls, plasterboard was attached to studs used to frame the walls. A stucco paste was applied to the plasterboard. The family used a formula for the stucco containing a sheetrock paste as the main ingredient. Half timbers were cut to

size, stained and placed on the plasterboard before the stucco was applied. Heating was provided by cutting vents into the existing heating ducts boxed out in the ceiling.

Slides 21 and 22. The bar-kitchen contained storage for glassware, trays, and cooking utensils. A small unit containing a range, sink and refrigerator, was built in under the shelves partially placed beneath the staircase. This area is lighted by general overhead lighting and special lighting in wall brackets along the glass shelves to give extra light for the working area and also a decorative effect to the glassware.

Slide 23. The color scheme of the room was chosen to make the room seem both warm and spacious. This was accomplished by choosing a ruby red acrilan commercial grade carpet for the floor covering and white stucco walls with dark walnut stain, rough textured beams. The smooth black vinyl covered cushions in the seating area offer a contrast in texture and color. The warm colors in the stained glass windows are repeated in the accessories around the room.

Slide 24. After fourteen months of construction by the family, with help from a carpenter who built the bar cabinets, the room was ready to meet the space needs of an active family.

Slide 25. This Forsyth County farm house built in the early 1900s was purchased three years ago by a family of five. The

surrounding woods and fields offered plenty of space for enjoying the outdoors but the home presented many space problems. Many of the rooms were small and dark. The master bedroom had too many doorways for adequate arrangement of furniture. To solve these problems, the owners planned an extensive do-it-yourself remodeling job.

Slides 26 and 27. The first major project was the installation of a large window on the east side of the house to give light and a view to the new area of the living room which had been developed by removing a wall from one of the small rooms formerly used as a bedroom.

Slide 28. In the master bedroom a corner doorway was removed next to an outside wall and window. The walls were repaired and wallpapered; the fireplace was refurbished and put into use.

Slide 29. After removing one of the bedrooms downstairs it was necessary to provide more space for rest and privacy. Two bedrooms, a small study and bath were planned in the unfinished attic. Special attention was to be given to the materials chosen. They were to agree in scale and proportion and harmonize with the general decor of the downstairs.

Slide 30. A staircase was built leading from the central hallway to a large attic with adequate floor supports and headroom space making it suitable for conversion.

Slide 31. A front dormer with windows and a door leading to an unfinished porch had been built by the original owners to give light to the attic. A small study was planned for the dormer area.

Slides 32 and 33. Most of the attic joists were in good shape and only a few new ones were needed to give extra strength. Some of the small windows were replaced with larger ones. Blanket insulation was added to walls, floors, and ceilings before electric baseboard heating was installed.

Slide 34. The rough plumbing and electrical wiring were completed before the walls were closed in. Plasterboard and prefinished paneling were used for the walls. In the bedrooms the walls and ceilings were covered with an inexpensive vinyl coated paneling.

Slide 35. The low ceiling area in the bedrooms offered plenty of closet space. The homeowner salvaged the doors from the downstairs space conversion, cut them down and hung them on the upstairs closets.

Slide 36. All of the furnishings used in the upstairs rooms were recycled from garage and attic sales. The carpets of nylon shag were installed by the homeowner.

Slides 37 and 38. The housewife constructed most of the window treatments, slipcovers, pillows and bedspreads used in the bedrooms, and plans are made to complete the furnishing of the small study and bath in the coming year.

Slide 39. The work completed in this home demonstrates how space in the home can be obtained with good planning and hard work at a minimum expense.

Slide 40. Near downtown Winston-Salem there are neighborhoods with large colonial homes built over 60 years ago. In the last twenty years, with the migration of young families to the outer suburbs, many gracious older homes have been left to deteriorate. With the shortage of new living spaces over the last few years, many of these homes are being purchased, restored or remodeled to suit the space needs of the modern family.

Slide 41. This typical colonial home with its formal dining room, living room, kitchen-breakfast room and four large bedrooms, offered little space for an active family of five to pursue hobbies, play games or for extra sleeping space for an overnight guest without disturbing the original space planning for formal living.

Slide 42. It was decided by the homeowners to convert the large attic with its high ceilings to a family room and a professional remodeling contractor was employed.

Slide 43. The first problem the remodeler faced was the absence of a stairway to the attic. The only entrance was through a pulldown staircase in a bedroom. This was solved by installing a spiral staircase in the upstairs linen closet which was centrally located.

Slide 44. Existing dormers and a side window offered enough light and a well supported solid floor had been installed when the house was built.

Slide 45. The walls were framed and hickory paneling was installed over plasterboard.

Slide 46. A separate electric heating system was added and because of the extreme heat in the attic during the summer, air conditioning was included even though it is not needed in the rest of the house.

Slide 47. A storage wall was designed providing a built-in desk and bookcases. Storage cabinets were planned for games and hobby materials.

Slide 48. A small bumper-pool table occupies a space away from the television viewing area, with plenty of space allowed for movement around the table.

Slides 49 and 50. An old oak wardrobe found in the attic was refinished and used to conceal the television and book storage.

Slide 51. The problem of space for an overnight guest was solved by adding a small day-bed which is used for seating during the day. Space for rollaway beds was provided in a closet.

Slide 52. The warm woodtones of the hickory paneling and the red plaid acrylic carpeting add a touch of informality to the formal home.

Slide 53. When this 4-bedroom home was new in 1969, the young family who moved in felt that it had adequate living space. When the family members increased from four to six, more bedroom space was needed for the children due to age and sex differences. The mother and father wanted a larger master bedroom with a sewing area for the

mother and a place for father to sit and read, away from the other members of the family.

Slide 54. Most ranch style homes, such as this one, have large attics which have almost one half of the area of the downstairs and this one had adequate head space and a centrally located stairway leading from the family room on the first floor.

Slide 55. An interior designer was consulted to work with the homeowners on the space planning and to draw up floor plans including a wiring plan to be used by the remodeling contractor. The homeowners wished to choose the materials and do their own decorating. Several bids were taken from various contractors and their work was reviewed before a contractor was chosen.

Slides 56 and 57. It was necessary to add a dormer for light and to add headroom to an area planned for sewing and reading. The dormer was placed on the back of the house away from the view of neighbors and the street. The dormer area was completed quickly to prevent bad weather damage to the interior when the roof was opened.

Slide 58. In the plans, areas were included for a large walk-in closet, full bathroom, a king size bed, television viewing, sewing cabinet, chairs and several chests.

Slide 59. The area to be converted was insulated with blanket insulation and a light smoke-grey pre-finished paneling was attached to the framed walls. A plush white acrylic carpet was chosen for the

floor covering. The blue, white and smoke-grey color scheme set a calm mood and made the room visually spacious.

Slide 60. The bathroom area located in the dormer is over a downstairs bathroom which made installation of plumbing less complicated. Two sinks were installed to make the dressing area for two more efficient and a fiberglass tub and shower unit were chosen.

Slide 61. The new master bedroom with its own electric heating and air conditioning systems provides a private retreat for the husband and wife.

Slides 62 and 63. A city planner moved his wife and four sons to this 30-year-old Cape Cod style home on a quiet street near the downtown area of Winston-Salem in 1969. After living there several years it became evident that the garage was seldom used for storing the cars due to a poorly designed driveway with little back-up space. It was more convenient to park on the street or at the end of the driveway. With more living space needed, it was decided to convert the seldom used garage into a family room.

Slide 64. The garage was attached to the back of the house with a small hallway between the house and the family kitchen. The hallway was eliminated and a set of steps was built to the garage from the kitchen which was on a higher level.

Slide 65. The room was planned for easy maintenance. The floors were of natural brick with drains set in the corners so that the floor can be cleaned with a water hose.

Slide 66. When the remodeling project began it became necessary to add structural beams. The old garage door entrance was enlarged and closed in with french doors. A fir paneling with a wax finished was used on the walls. The combination of materials used - brick, glass and wood - gave the room a natural look of informality.

Slides 67 and 68. Space in the room was provided for relaxing, listening to music, watching television, pursuing hobbies or playing games.

Slide 69. This family home was built over six years ago in the Sherwood Forest section of Winston-Salem. It is located on a dead end street with a wooded back lot.

Slide 70. The homeowners spent much of their leisure time on their hobby, growing house plants. A greenhouse area was desired in which to work and care for their numerous house plants, along with an area to entertain or relax with the family and friends.

Slide 71. It was decided to close in the porch located off the breakfast and family room, to provide the necessary room upstairs for relaxing and entertaining and the area underneath the porch would be used for the greenhouse.

Slide 72. The conversion of the porch to a room and greenhouse was to be a major home improvement and although planned by the homeowner with the help of an interior designer, the work was done by a remodeling contractor. Special attention was given to matching

the new building materials with the original materials used in the home's construction.

Slides 73 and 74. The areas were planned with as many windows as possible to provide light for the growing of plants. The greenhouse area was planned for the control of temperature and humidity to provide ideal conditions for plant growth.

Slide 75. The addition of the new room was carefully planned to avoid cutting off all of the outside light from the adjoining breakfast room area. A large window was located in the wall between the two rooms, offering light to the breakfast room from the new room with its glass windows, white walls and ceiling and white wicker furniture.

Slide 76. Space was provided in the corner of the new room for playing games or serving party foods.

Slide 77. The interior designer helped the homeowner choose the fabrics, furniture and accessories for the room and made the final furniture arrangements.

Slides 78 and 79. The greenhouse proved to be not only a room in which to care for the plants but also provided space to sit and relax away from family activity.

Slide 80 This project, just as the others shown, demonstrates that a family can adapt its spatial arrangements to its needs instead of always adapting to the housing space. Each home conversion project is unique and there can be no hard-and-fast rules to govern

the work. However, many problems could be eliminated by following these fundamental steps:

Slide 81. Examine condition of home and correct any structural weaknesses.

Slide 82. Check local building ordinances.

Slide 83. Consolidate ideas and have plans drawn.

Slide 84. Estimate costs and arrange financing.

Slide 85. Select a contractor or prepare to do-it-yourself.

CHAPTER V

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Summary

It is an economic impossibility for the typical family to move each time its space needs change. There are alternate spatial arrangements available to families within most basic home structures. Many homes have attics, basements and garages used for storage. Porches sometimes exist but are seldom used during the summer heat if the home is airconditioned. These areas can be developed into family living areas with a minimum of expense.

The high cost of housing and the shortage of mortgage money have stimulated the home owner to consider developing existing under utilized areas within the home to meet family space needs. Emphasis on the necessity of preserving our nation's natural resources has made the homeowner more aware of the importance of preserving his home and better utilizing the available space. Modern technology has produced many innovative products which have made home improvement projects less complicated.

In this study a review of literature pertaining to space planning and home improvement was reviewed and compiled into four divisions: family space needs, gaining living space, considerations when converting space and planning and designing new use of space. From

this information, a slide series with commentary was developed which could be used as an educational medium.

Conclusions

More families have chosen to stay in stable neighborhoods and expand or rearrange the existing spaces in their homes to meet their space needs. More information could be made available to them on the help available from the interior designer when planning home improvement projects. Families could be better informed that interior designers can design spaces, prepare plans, suggest building materials, furniture arrangements, paints, and floor, wall and window treatments.

A new career opportunity could be available to the interior designer with the increased interest in designing new areas for family living from under utilized spaces in the home. The interior designer could work with the homeowner on do-it-yourself projects or with the remodeling contractor.

Recommendations

More information could be made available on the converting of spaces in order to motivate the homeowner to better utilize those spaces that might be available to him within his present home. Additional research is needed on new concepts of space use and alternate spatial arrangements in the home to meet overall human needs.

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