To the Graduate Council:

I am submitting herewith a thesis written by Randall Nelson entitled "A Study of Knox County Female Labor Force Participation and Its Relationship to Residential Location and Accessibility." I have examined the final copy of this thesis for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Master of Science in Planning.

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We have read this thesis and recommend its acceptance:

Accepted for the Council:

The Graduate School

A STUDY OF KNOX COUNTY FEMALE LABOR FORCE PARTICIPATION AND ITS RELATIONSHIP TO RESIDENTIAL LOCATION AND ACCESSIBILITY

A Thesis

Presented for the

Master of Science

Degree

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ABSTRACT

The female labor force participation rate has been rapidly increasing over the past 40 years. The phenomenon has caused changes in household composition and society in general. What is the effect of these changes on city structure? Conversely, how does city structure affect labor force participation of women? These questions were explored in this thesis. The compatibility of female labor force participation with the urban environment was measured using relative residential location and accessibility to employment in Knox County, Tennessee.

The analysis was based primarily on census data. First, a 20 year profile of the labor force was examined and projected by occupation to the year 1990. Then, stepwise multiple regression techniques were employed to select models for each of four labor force categories: male, total female, women with children under six, and married women. Locational and accessibility variables were compared to socio-economic variables for each labor force category.

It was found that women's labor force participation is more sensitive to location and accessibility than men's. Two specific indications were found. First, female labor force participation increases with proximity to shopping centers, indicating that single women concentrate in these locations. Second, labor force participation of women with

children under six increases with density and a decrease in family size. This indicates that household duties coupled with low density imposes added constraints on these women's labor force participation. Day-care is mostly needed in cities. No evidence was found of changing residential patterns. Because of the imcompatibility of suburban housing with new household formations, it is concluded that there is a lack of comparable city-housing choices.

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CHAPTER I

INTRODUCTION

Smith (1979) has called the phenomenon of the increasing rate of female participation in the labor force "a subtle revolution." The phenomenon is changing the traditional relationships of women to work, money, marriage, and family. Thus, it has effects on many facets of community life. Eli Ginzberg, noted Chairman of the National Commission for Employment Policy concludes:

> The revolution under way in the role of women in the world of work will have more import for modern societies than the rise of communism or the harnessing of nuclear power. (Ginzberg, 1979).

Labor force participation is a measure of those individuals over 16 years of age who are willing and able to work. In 1890, the first year for which usable labor force information is available, the census revealed that 17 percent of all workers were female and that 18 percent of the female population age 14 and over (minimum age was changed to 16 in the 1960 census) were in the labor force. Only 4.5 percent of married women were in the labor force at that time. Between 1890 and 1980 the female labor force participation rate grew from 18 percent to just over 51 percent!

The sharpest sustained increase in the participation rates of women have occurred in the past few decades. Between 1947 and 1980, the participation rate of women increased by 19 percent. The post-World War II participation rate increase is primarily a result of increased participation by married women. Between 1947 and 1980 the married women's rate increased from 20 percent to 52 percent. The increase in participation rates among single women or women who were in other marital categories (separated, divorced, widowed) were much less pronounced, because a substantial percentage of them have always worked. The question is: Why has the married women's participation rate increased?

Over the years, economists and sociologists have addressed this issue. While none of their explanations can be assessed independently, there are several significant factors that can be combined.

Included among the economic explanations, are the decision-making and the real wage theories. The theory of decision-making states that an individual weighs the benefits of working in the market place to other activities; such as going to school full-time, home making, volunteer work, and leisure. The phenomenon of the increasing labor force participation rate of women suggests that the perceived benefits of being in the labor force outweigh the other activities. The "opportunity cost" of

staying at home all day has become too great for an increasing proportion of women (Smith, 1979). Why has the opportunity cost increased? The real wage theory offers an explanation. As the economy has expanded throughout most of this century, real wages (adjusted for inflation) have increased, but there has been no corresponding increase in the rewards of working within the home. As wages rise, paid labor is substituted for unpaid activities outside the labor market. Even though the increases in husbands' earnings throughout most of the century have permitted improvement in living standards without the wives' entering the labor force, many wives have chosen to work. The economic explanation is that women are faced with a three-way choice, rather than a simple labor versus leisure choice. For them, the third option is unpaid work within the home. An increase in family income from two wage earners permits reduction in unpaid work through the purchase of labor-saving devices, restaurant meals, and the like. Thus, increases in real wages over time may stimulate more participation in the labor force for married women (Mincer, 1962; Cain, 1966).

Other long-run economic explanations include: (1) the tremendous growth in the kinds of jobs which are thought to be most appealing to married women or for which employers are most willing to hire women--service and office employment, and jobs that permit part-time

schedules; (2) the requirement of physical strength in many industrial sector jobs has diminished--machines and computers are doing a larger share of the work; (3) women are acquiring increasing amounts of education which enables them to qualify for jobs that are both better paying and more interesting; (4) the decline of the so-called male "living wage." A growing proportion of middle and working class families find it increasingly difficult to achieve what they deem an acceptable standard of living on only one income (Blumberg, 1980). Many intact families thus cannot afford to ignore the income a woman can provide (Vickery, 1979).

Sociologists have focused on demographic and attitudinal influences that have reinforced (or caused) these economic factors. Among the demographic influences on the increasing rate of female labor force participation include later marriages, rising divorce rates, and declining birth rates. Here, it becomes difficult to separate the chickens from the eggs. Attitudinal influences reflect a general sort of liberalization and increasing acceptance of non-traditional, and especially nonfamilial, roles for women.

A critical issue becomes how have the new roles for women affected household formation and composition? Households have been forming at a rate greater than that of population growth. The average household size has

fallen from 3.37 persons per household in 1950 to 2.75 in 1980 (Sternlieb et al., 1982). Households are thus more numerous today and tend to be smaller in size.

Significant changes in the composition of American households have accompanied this fall in household size. Table 1.1. shows that the traditional family identified by a working husband and homemaking wife has been steadily eroding as a dominant family form. 60 percent of all household were this type in 1950, and 30 percent in 1980. Growing numbers of two-earner families, female-headed households, and primary individuals have taken their place. Thus, a diversity of family forms are becoming increasingly prevalent, and the so-called "traditional" family is no longer the norm (Gerson, 1982).

FACTORS INFLUENCING THE EMPLOYMENT OF WIVES

This section focuses on the factors which influence the decision of a woman to join the labor force. The trend has been discussed. The key to the trend has been identified as participation of married women in the labor force. What are the conditions that affect this individual decision?

There have been a number of classifications of the factors influencing the employment of wives. Regardless of the scheme, the factors themselves remain fairly constant. Sobol (1963), in a study of the determinations

Table 1.1. Household Composition: 1950-1980 (in percents).

	Married Couples		Headed by Women	Primary Individuals[a]	Other[b]	Total
	Home-making Wife	Working Wife				
1950	59.4	19.6	8.4	10.8	1.8	100
1955	54.2	21.7	8.8	12.8	2.5	100
1960	51.2	23.2	8.5	14.9	2.5	100
1965	47.0	25.6	8.7	16.7	2.0	100
1970	41.6	28.9	8.8	18.8	1.9	100
1975	36.6	29.2	10.0	21.9	2.3	100
1980	30.3	30.6	10.8	26.1	2.2	100

a. Single adult living alone or with unrelated persons.
b. Primarily male-headed families with no wife present.
Sources: Hirschhorn (1977); U.S. Bureau of the Census (1981).

of the commitment to work on future work plans, classifies these determinats under three major headings:

1. Enabling Conditions (family status)
   a. number of children now
   b. ages of children
   c. future of child expectations
   d. current pregnancy.

2. Facilitating Conditions
   a. education
   b. previous work experience, prior to and since marriage.

3. Precipitating Conditions
   a. financial factors
      i. husband's income
      ii. wife's income
   b. attitudinal factors
      i. life satisfaction
      ii. need for accomplishment or occupation of time.

Following is a discussion of the factors which have been found to be associated with labor force participation of wives (Sweet, 1973).

Economic Pressure

A number of sample surveys have asked wives why they are working, or why they had been working. Invariably, more than half of the women respond in economic terms (Sobol, 1963; U.S. Dept. of Labor, 1965). There is a steep decline in the proportion reporting working to meet chronic or temporary financial problems as husband's income rises. As husbands' incomes rise women were more likely to report working to acquire assets, while as it rises higher, occupying time is a major reason.

It is not possible to base this factor merely as a function of current income. A given current family income implies a different level of economic pressure depending on the number of family members, amount of debt, the amount of assets, etc. The stability of the family's income may also be relevant. If a husband has experienced recent unemployment, his wife's participation is more probable than if his employment has been stable.

Employability and Earning Potential

An important determinant of the possibility of employment of a person is their ability and willingness to perform tasks for which there is a demand. After employability is determined, earning potential influences the probability of working. The more money a woman can earn by working, the more likely she is to work, all other things remaining the same. This is the same principle as the real wage theory which pertained to the population.

Education level can be used as a proxy for earning potential. Education has always been found positively correlated with employment of wives. Education is also positively correlated with the opportunity to find expression of various psychological needs for which women seek work (need for self-expression, need for power, etc.) (Bowen and Finegan, 1966).

Family Composition

Family composition is largely conceived as a constraining influence on the work of wives, in that family responsibilities take time and have a higher priority than other uses of time. Thus, women with children are less likely to work than women with no children, and women with many children are less likely to work than those with few children. Similarly, younger children require more care than older children, thus depressing the probability of the employment of their mothers.

A family composition factor that is seen to facilitate employment of wives is the presence of other adults or older children in the household, along with young children. These people may serve as baby-sitters, freeing the mother to work.

A last family composition factor that may influence the probability of employment of wives is the financial support or expected support of children in college. This would depend on the age of the child at present. It could also be considered an economic pressure phenomenon.

Employment Opportunities

Areas differ in the number of employment opportunities for women (Belloc, 1950; Bowen and Finegan, 1965). An economic base can be favorable or non-favorable to the employment of women. For example, a heavy manufacturing

base is not considered favorable to women. The higher the unemployment rate, the lower the rate of labor force participation for women. More women become discouraged and leave the labor force when jobs are scarce than are induced to enter the labor force because of the unemployment of primary workers.

Psychological Factors

Hoffman (1963) suggest that high need for achievement may lead to higher employment through two channels: a desire for upward social mobility and a desire for a sense of competence. Women are becoming less satisfied with the housewife and mother roles. They are searching for self-fulfillment. Hoffman also mentions the possible association between the need for power or dominance, the need for freedom or independence, the need for social contact, and the fear of aging and losing vitality as possible influences on the employment of wives.

Race

Nonwhite wives have considerably higher rates of employment than white wives. Several reasons have been suggested by Cain (1966): 1). For both white and black women, those who have been married more than once have higher rates of employment. Nonwhite wives are considerably more likely to fall in this category, 2). discrimination in housing forces blacks to live in less

desirable dwellings which may cause less desire for housework, 3). discrimination in the male job market may cause substitution in market work from husband to wife.

Fertility

The shorter the first birth interval and the more rapidly the family is formed, the lower the level of current income and the lower the level of asset accumulation of the couple. Women who have children very shortly after marriage have much less chance to work and consequently make a lower contribution to asset accumulation.

DISCUSSION OF THE PROBLEM AND NEED FOR THE STUDY

Some view the growing female participation rate with enthusiasm. Some fear the problems that might be created, such as breakdown of the family structure, shift of overall job market opportunity, and the effects on children. For better or worse, many more women will be joining and remaining in the labor force. The phenomenon is an inevitable stage of our cultural evolution. It is happening now. Public policy decision-makers, planners, and all individuals need to be prepared, anticipate the consequences, and accomodate the phenomenon.

There are basically two physical spheres of influence on a woman's decision and ability to work: the home, and the work place. This thesis, in part, tests the hypothesis that the space in-between the two spheres can also

affect, or be affected by, labor force participation of women. This space is the planner's domain.

Traditional planning practices and principles that have contributed to urban structure, such as the neighborhood concept and district zoning, are based on the activities of the "traditional" family: male breadwinner and wife homemaker. With wives increasingly joining the labor force, this concept of the family unit is deteriorating. The roles of women have changed. Household daily activities have changed. Are these changes compatible with the existing urban structure?

The consequences of an incompatibility would be, at least, an imposition of strain on the family unit and on the woman's daily activity schedule. At worst, the incompatibility could constrain the labor force participation of a woman. Why should this concern city planning? Five reasons are offered.

First, planning should be responsive to "real" needs. Needs must be constantly monitored. If the population's needs change, so should planning practice. Second, married women represent a traditionally untapped labor market. There are economic development implications associated with this resource. The labor force can expand by increasingly employing these women, without creating the necessity to increase city services from the addition of new households. The workers are already there. Planners working in economic development need to know how to

faciliate wives joining the work force. Third, the subject has implications within the general multidisciplinary field of environment and behavior. Can the built environment have an impact on work behavior? Fourth, assuming that land use, service accessibility, and transportation systems can affect female labor force participation, equity questions arise. If one neighborhood's location is more conducive to wives working due to public expenditure (for example, freeway construction or the issuance of industrial revenue bonds for new employment) then more of them will gain employment, thus raising household income. Another neighborhood under the same job market conditions with the same skills, could be disadvantaged. And finally, if the incompatibility of urban structure and changing household composition exists, different residential location choices may be forming. Career couples and working women could be a factor in revitalization of center cities. It has been found that women have greater need for centralization of services and employment (Gerald and McCormick, 1978). This may be a factor in gentrification.

These are all important issues for planners. Current practice lacks research on these issues. This thesis is an exploratory analysis of the relationships between residential location, accessibility, and female labor force participation. The central hypothesis is that there

exists a basic incompatibility between urban structure and the daily activities of the emerging dominant households--the two-earner family and the female-headed family. The daily activity that is measured is the most critical--labor force participation of women. Variance between participation and residential location and accessibility is measured. Two secondary hypotheses are formulated: (1) female labor force participation is more affected by residential location and accessibility than men's. The effects should increase with married women and women with pre-school children. (2) different residental location choices are being made. Specifically, that the new households are choosing locations more convenient and accessible to employment. Evidence of either secondary hypothesis will have implications for the central hypothesis.

THESIS ORGANIZATION

The next chapter is an overview of the literature on the relationship between women and the urban environment. It discusses planning practices and family roles. Chapter Three explains the data and methodology of the study. Chapter Four gives a profile of the Knox County female labor force. It discusses historical trends of participation, present situation, and forecasts for the future. Finally, Chapter Five gives the results of the analysis, and conclusions of the study.

CHAPTER II

WOMEN AND THE URBAN ENVIRONMENT

A LITERATURE REVIEW

Within the last ten years, interest in women's issues has focused on the urban environment. The primary cause of this attention is the increasing labor force participation rate of women. Research into the issues are spread over a variety of disciplinary sources: urban and architectural history, urban geography, urban sociology, economics, political science, planning, architecture, and appropriate technology. The issues, of course, vary with the discipline. There is, however, one fundamental contention underlying all inquiries into the woman/urban environment relationship: are women's overall experiences of the urban environment substantially different from men's thereby constituting an interest group with unique needs and influence? If so, what are the implications and causes? This contention is central to this chapter and could have profound consequences for the planning profession.

The issues that bear on the women/urban environment relationship were first brought forward in a workshop

sponsored by HUD in 1973. Recommendations for change were identified in the areas of community design, housing, transportation, child care, and the provision of supportive services (Hapgood and Getzels, 1974). This chapter examines these areas as they affect, and are affected by, labor force participation of women.

Werkle (1981) has proposed an excellent operational guide to research on the general relationship between women and the urban environment. She defines three dominant paradigms in the literature: (1) the "public-private dichotomy" paradigm which is created by the segregation of sex roles. The dichotomy signifies women's function in the private world of the family, and men's domination of the public world of labor and politics, (2) the environment and behavior paradigm emphasizing the "fit" between women's activities and the environments of home, neighborhood, and the city, and (3) the environmental equity paradigm which focuses on women's rights to equal access to public goods and services such as transportation, housing, and social services.

MALE/FEMALE ROLES

The beginning to an understanding of the relationship between women's labor force participation and the urban environment is a comprehension of the perspective roles

that society places on each sex and the responsibilities that are associated with that role. Male/female roles must be examined on two distinct levels. First, as a foundation, the macro-level considers effects on urban structure. Secondly, a micro-level analyzes male/female roles in relation to family responsibility.

Urban Structure

Some social scientists have pointed to the industrial society as the causal factor in separating residence from work (Goldstein, 1975). It is argued by Boulding (1977) that the seclusion of women in the home was a direct result of the growth of urbanism. In the process of urbanization women's work was removed from the communal work spaces of the village and relegated to the private space of the individual home. This is significant because it is in the public space where political and developmental decision-making is practiced. Markusen (1981) states that "urban spatial structure is a product of the organization of the patriarchal household and the capitalist organization of wage work." This argument is seen to be exemplified by the character and existence of suburban communities. Suburban development has been guided, in part, by a family organization where the women stays home and the man commutes to work. The consequence is fundamental. If a basis on which urban structure has been

formed is that the man goes to work and the wife stays home, then those structures could impose constraints on a socially changing role segregation and household formation.

The major conclusion of literature on this subject is that the social institution of segregating work roles by gender has contributed to the structure of our cities. And that this structure, in turn, reinforces the segregation (physically, and economically by wage differentation and occupational segregation) and causes constraints to the change of the social institution. It points toward a complex, extremely interesting interplay between social behavior and the physical environment.

Family Responsibility

At the household level, family responsibilities present constraints to women's labor force participation. Specifically, the combination of wage earner roles with women's traditional mother and wife roles imposes time constraints on their daily activity schedules (Damm, 1978; Berk, 1980). In spite of the trend of women's increased labor force participation, they still do the majority of housework and childcare in most families. The proportional amount seems to decrease with socioeconomic status and size of household (Damm, 1978). According to Glazer et al. (1976) women's work in the home for an average

employed American wife/mother equals 26 hours per week. This is added to a regular work weeks of 40 hours. An issue becomes how to make these roles congruous in the urban environment.

Palm and Pred (1977) concluded from a study that time schedules imposed by household duties made involvement in pursuits outside the home difficult, if not impossible for many women. Many researchers belive that the key to the problem of overburdening working women with multiple roles is the sharing of the gender-based division of labor at home (Glazer and Waehrer, 1977). Saegert (1980) states an aspect of women's lives that affects their abilities to combine home-related activities and values with pursuits and fulfillments in other domains is the degree of sharing of household tasks with a partner. There is wide agreement that the change in family responsibility will only come about indirectly through changes in the wider social world--changes in the hours of work, the availability and acceptability of part-time work, and an increasing network of support services and alternatives to the isolated nuclear family (Wekerle, 1980).

Rapoport and Rapoport (1972) believe that there is a psychosocial lag between the changes occurring for women in the macrosocial world of work and the microsocial world of the family. They predict that these problems of adjustment will be resolved as the family "catches up" to

changes in the work place. This view is debatable. Pleck (1984) has stated about the work-family role system:

> It does not seem possible for large numbers of families to function with both partners following the traditional male work model. Such a pattern could become widespread only if fertility dropped significantly or if household work and child care services became inexpensive, widely available, and socially acceptable on a scale hitherto unknown.

There are three responses to modulating housework and child care in the single family home. These responses do nothing to change family responsibilities. The first is concerned with the basic redesign of the house interior to ease house care duties (Hayden, 1980; Rock, Torr and Wright, 1980). Feminist architects focus on how the North American obsession for the single-family house has worked to keep women at home by increasing the necessary household duties.

Secondly, there are proposals to shift some of the tasks which tie women to the home into the public sector of paid labor. Galbraith (1973) states that labor force participation of women has been a factor in the growth of the service industry in the past, and that the industry's predicted future growth is a solution to women's confinement at home. But, as Wekerle points out, this is a limited solution for if services are restricted to the private sector, low income groups may be excluded.

Glazer et al. (1976) suggests the establishment of federally funded neighborhood service houses called Neighbors in Community Helping Environments (NICHE). These houses would provide some of the services now carried out by a full-time person in the home. For example, supervising children's play and homework, visiting sick children, providing access to repair and delivery people, or preparing hot meals for families to take home with them. A similar service has been institutionalized in Sweden, where a position called "Samaritan" is supplied and paid for by the municipality. This family support system is advocated by Glazer and her colleagues because they feel that women's issues are causing the deterioration of the family. And the family is worth peserving as a basic unit of society.

A third response to easing housework in the home is proposals for the collectivization of housework (Hayden, 1977). This response advocates organizing household tasks such as cooking, cleaning, and child care collectively and defining housework as a concern of the total community. It represents a challenge both to the private home and the nuclear family.

It could be concluded from this discussion that changing male/female role responsibilities is the essential key to facilitating women's labor force participation. It could be further argued that complete

equality in the home would bring women's needs in the urban environment equivalent to men's. Therefore, since the city is structured to fit the male work model, no alteration of the physical environment would be necessary. It is important to understand, however, that there is a shift of emphasis in household needs--not only women's needs. New dominant households are emerging: the two-wage earner household and the female-headed household. These households will not fit into the urban structure that has been set in place by the "public-private dichotomy." The basic means to facilitate the compatibility of these households is to plan for the accommodation and convenience of women's labor force participation. Not only for the woman, but also for the preservation of the family and community.

FIT BETWEEN LABOR FORCE PARTICIPATION OF WOMEN AND THE COMMUNITY ENVIRONMENT

"Environmental fit" is a concept developed to describe the congruence between environments and patterns of behavior (Michelson, 1974). The concept does not imply that behavior is believed to be determined by the physical environment. It presumes, however, that in a particular environmental setting, some patterns of behavior are viewed as easier to develop and maintain, while others are more difficult or even impossible. The issues in this

paradigm have to do with community design in residential environments and how these environments fit with women participating in the labor force.

Life Cycle

When considering community design and work behavior, it is critical to analyze needs in a life-cycle context. One of the most basic modifiers of women's labor force participation is the presence or absence of children. Traditionally women's life cycles are closely associated with the family life cycle (Sweet, 1974). Sweet has analyzed women's labor force participation by age cohorts. He finds the following general trends: participation increases from the women's ages of 14 through 24; then decreases from 24 to 34; then increases from age 34 to 45-49 where it peaks; then steadily decreases into elderly age. Hapgood and Getzels (1974) examines these four stages in a woman's life and applies the community design considerations that are germane to them:

1) Single Women. Young, single women as a group probably are less concerned than any other age group about the impact of community design upon their lives. They are the most mobile and independent age group. Single persons are considered primarily a rental housing market. Jobs, shopping centers, and recreational facilities are continually located in the suburban ring--the domain of

single family homes. A whole generation has grown up in suburbia. Single women, who traditionally have migrated to the city, now may desire the option of remaining in the suburbs close to family, friends, and jobs.

2) Women with Children. Community design affects the lives of women and children, regardless of their economic status. This is the time in a woman's life when family responsibility is at its peek, therefore, if a woman in this group wants to work, there is a high demand for supportive services in the community. Good public transportation, local jobs, child care, local shopping and recreational facilities are all essential. Nevertheless, there exists a basic need for these things in all environments. Suburbia was built for this woman (Popenoe, 1977) as long as she stays at home. Now that she is working, her needs have become the most demanding.

3) Middle-aged Women. Enormous improvements have been made in the health, vitality, and mobility of middle-age women. The increased demand for women workers has opened up new jobs and career opportunities for these women whose children have grown and left home, or are divorced or widowed. They are more likely to be homeowners than single women, but share the same sense of "out-of-placeness" in environments built for active families. They also need local facilities and housing flexibility, but especially education and job training on

a continuing scale to enable them to re-enter an ever changing labor force.

4) Elderly Women. The aging population is increasingly a female population. As these women leave the labor force permanently, the positive contributions that they can make in providing services to the community are often overlooked. Communities should encourage them to do so and provide opportunities for them to remain in their communities once they retire.

The major thrust of Hapgood and Getzel's review of life cycle stage considerations in community design is that communities must be planned to fit all stages in the life cycle--not just the woman with an active family.

Kaplan (1981) studied community facilities use in terms of family life cycle. She found that there is a decline in the use of facilities by families when children are very young, an increase as children get older, and then a decrease once again as the women advance into the empty nester stage. She also found that the most satisfied with residential communities and transportation facilities are married young and older couples. Thus, at times when families are at their smallest, women report the highest levels of residential satisfaction. These types of phenomena are generally overlooked in community design. Specific household composition is an important factor in the demand for community facilities and a

woman's participation in the labor force. It appears that as a woman's family is expanding, she finds it difficult to contribute time to either.

Zoning

Zoning is an enforcement tool for community design. A focus on zoning raises several issues between land use controls and women's labor force participation

First, zoning is the means whereby the home is segregated from the work place. The discussion in MALE/FEMALE ROLES suggested how deeply ingrained this practice is in our society and in the physical aspects of the city. In terms of the neighborhoods, the segregation often excludes home occupations unnecessarily, thereby making it more difficult for women to combine work and family roles (Toner, 1976).

Secondly, traditional district zoning creates residential communities that are physically and socially homogenous. This practice has several limitations. It limits the location of child care facilities and other support facilities. A study in Toronto showed that parents and children traveled an average of 26 blocks to day care (Johnson, 1977). Homogeneity limits the availability of local convenient shopping. It limits mobility of women through their life cycle in the same neighborhood by creating uniform housing style and value. Hapgood and

Getzels (1974) state that women need varied economic and social opportunities in their communities. Women's combination of family roles and work roles require locational integration of residences, jobs, services, and recreation. Present zoning ordinances do not allow this.

The third means by which zoning impacts women's labor force participation is the definition of "family" in communities and the limitations that it implies. Zoning ordinances which define "family" in very restrictive terms puts severe constraints on what Netter and Price (1983) call the "nouveau poor." The nouveau poor are female-headed households who have experienced a domestic shift from middle income to low income status due to divorce, widowhood, or abandonment, and who own their own homes in America's suburbs and small towns. From 1970 to 1980, the number of these families have increased from 3.3 million to 6.6 million (U.S. Department of Commerce). Zoning regulations, such as those with restrictive definitions of family and age-restrictive zoning regulations and covenants, deny these families the opportunity to enter into house sharing arrangements or to divide their homes into principal and accessory units. Because of their sudden low-income status, they are forced to leave their homes because they cannot afford the mortgage alone. Divorce rates continue to increase. The U.S. Census Bureau estimated that 40 per cent of all marriages would

end in divorce within the next decade. This family's problems will continue to increase. Their needs must be analyzed in relation to employment patterns. The women have a particular need to be close to their jobs, but this may be disrupted by a divorce if they are forced to move consequent to the divorce. These types of residential shifts may impact labor force participation at least temporarily.

Finally, female-headed households are a substantial segment of the low-income population and they join the battle against exclusionary zoning. Jobs and residences must stay in sync. Franklin, et al. (1977) points out that Federal housing and community development legislation implemented in the 1970's adopted the principle that localities should provide a supply of housing adequate to meet the needs of those employed in the locality. This principle has strong implications for women who head their households. They specifically need low-income housing in proximity to employment centers.

The remainder of the discussion on this paradigm examines three particular environments and their fit with women's labor force participation.

Suburbia

A large amount of research has been conducted on the fit between families and the suburban environment. Recently, however, differences within members of the same

household have been studied. Michelson (1977) examined data which shows that suburban housewives are increasingly satisfied with the social characteristics of their neighborhood, and increasingly dissatisfied with the locational aspects. Men in the same suburb remained satisfied with both. A residential satisfaction survey conducted on wives by Rothblatt, et al. (1979) shows that household distance from the central city and travel time to work varies negatively with residential satisfaction. The imposition of time/distance costs to employment associated with suburban location is a persistent theme in the literature. The ability to overcome these conditions vary significantly with age, race, and socio-economic status (Fava, 1981).

Popenoe (1977) compared suburbs of lower middle income families with young children, in America and Sweden. He found a much higher rate of labor force participation in the Swedish women. Popenoe attributes the higher rate to the better fit of their communities to women's labor force participation. Sweden has "compact, physically focused suburbs heavily endowed with public services." The conclusion of this study is that the major flaw of American suburbs is the lack of local facilities that are essential to working women, and in accessibility to those that are available.

Another persistent theme in the literature is that women are the passive victims of post WWII suburban development; forced to subordinate their own interests to those of their husband and children. As Wekerle (1980) points out, this interpretation is overly simplistic, for women share the American dream of homeownership and willingly choose suburban locations. Because they choose suburban locations in spite of potential inconvenience to their labor force participtiption, a basic lack of housing choices could be deduced.

Planned Communities

Planner's efforts to provide different choices of living environments have not had large success in meeting the needs of working women. Goldstein (1975) criticizes New Town planners for using new concepts but the same old dated roles of housewife/mother-at-home. There are three basic issues which affect the lives of both working and non-working women in New Town communities: (1) proximity to high density areas, (2) adequate public transportation to these areas, and (3) child care arrangement. Goldstein concludes that New Town planners have not dealt with the life span concept, and that the notion of self-contained, controlled-density communities based on the traditional family may be arrived at by the sacrifice of working women's mobility potential. Temple (1974) examined the New Town of Columbia, Md. and states that the

"the chief weakness of the neighborhood concept as it relates to women is its view of the women who were to use it." She felt the view lacked sophistication. She concludes by advocating planning programs instead of processes and conditions to meet women's needs, and a better understanding of women as clients of planning.

Finally, a large-scale study of Twin Rivers, the first Planned Unit Development in New Jersey (Keller, 1981), showed that a sizeable group of women suffered from loneliness and boredom within the community, and from inadequate access to jobs or diversions outside of it. Specifically, the survey found that the house-bound woman with young children was not frequently bored. Employment as an antidote to boredom is a common argument by feminists for advocating women's labor force participation.

The three studies above indicate that new planning concepts of living environments are doomed for failure in meeting working women's needs, if they remain based on the function of the traditional family.

Center City

Research based on women and the center city have taken on different sorts of issues. The biggest planning issue for center city women is raising income--jobs (Piven, 1974). It is Piven's view that the life situation

of women in the central cities is largely defined by their race and their class. That is--minority and poor. These women are in need of some very basic services: decent housing, clean safe streets, parks, schools, shopping facilities, and most importantly, local jobs.

A study of New York City conducted by Gerard and McCormick in 1978 showed that 35 per cent of the households living in that city are single women or families headed by women. They show that the city has attracted career women because of a concentration of high-paying jobs and appropriate services. Yet, employment of women actually decreased over the 1970's in New York City. Gerard and McCormick offer two explanations. First, women in the city have been the hardest hit by the suburbanization of jobs. Second, the proportion of low-income minority women that are heads of households has increased. These women have higher unemployment rates. These trends in New York City are ominous for the rest of the nation's metropolitan areas. New York City is often a leading indicator of trends.

A final contrast is apparent in many inner-city neighborhoods. Many planners feel that these neighborhoods have the highest need for assistance. But several studies have shown that these older inner-city neighborhoods often provide the most supportive environments for

families headed by women who work (Brown, 1978; Stamp, 1980; and Milne, 1976). The environments have good access to day care, public transportation, schools, and other services that are necessary to support a single working mother.

WOMEN AND ENVIRONMENTAL EQUITY

The third major paradigm guiding research on the relationship between women's labor force participation and the urban environment addresses the issue of environmental equity. The equity issue arises from the question of how housing policies, housing location, and access to transportation and public services affect the real income and life chances of various groups in the urban population (Harvey, 1973). This section focuses on women as one of the various groups. First, the section looks at transportation and its critical effect on women's labor force participation. Then the relative location of housing to employment is isolated and examined. Third, access to services is reviewed. And finally, the distributional effect on income from the labor force participation of women is summarized.

Transportation

The transportation planning field has contributed a substantial amount of empirical research to the subject of

women's labor force participation and the urban environment. Transportation is certainly one of the most critical factors that are involved. A conference was held in 1978 by the Department of Transportation which focused national attention on women's travel issues. The proceedings from the conference poignantly document the issues in planning for women's transportation related needs. The general opinions and findings of the participants are: (1) that women's travel behavior is different from men's, (2) that present transportation planning practices fail to account for this difference, and (3) that there are implications from these differences for labor force participation and residential choice.

Madden (1981) emphatically states "women's worktrips are shorter than men's, regardless of whether time or physical distance is used as the measure and regardless of the place or the time period studied." This uncontested finding is substantiated by several studies. Hartgen (1978) found that the average trip length for all trips was reported as one mile shorter for women. A study by Paaswell and Rocker (1978) found that women travel further for shopping purposes, but men have longer distance work trips. For the journey to work, the average trip for a male worker in the U.S. was about 11 miles; a comparable trip for a female worker was about seven miles (U.S. Dept. of Commerce, 1979). Finally, in national longitudinal

studies it was found that married men spent 33% more time in the commute to work than married women(Madden and White, 1980).

Another important finding in women's travel behavior is that women make fewer trips per day than do men, both for work and non-work purposes (Hartgen, 1978). However, women make approximately double the proportion of shopping trips as made by men of the same marital status (Skinner & Borlaug, 1978). Most importantly--women make fewer single purpose trips; their trips tend to have multiple purposes (Cichocki, 1980).

The third important finding is that women use public transportation more than men and automobiles less. Data in 1975 showed a ratio of two to-one use of transit by women as compared to men (U.S. Dept. of Commerce, 1979). From a study of 5000 American families it was found that in two-earner households, 7 per cent of working wives used public transportation, in comparison to 3 per cent of working husbands (Morgan, et al., 1978). In regard to automobile use, the Department of Commerce (1979) found that 68.8 per cent of men were work-trip drivers compared to 59.6 percent of women; women tend to use cars more as work-trip passengers or in car pools.

In summarization of these findings on women's trip behavior, it has been observed that women make fewer trips, take shorter trips in time and distance, and use

public transportation more and automobiles less. The crucial question in planning for women's transportation needs becomes: why is women's trip behavior different?

Madden (1981) offers two reasons why women's work-trips are shorter than men's. First, women's lower wage rates and shorter work hours reduce their earnings, thereby reducing the economic return to their commuting. Second, their household responsibilities increase the time cost of longer commutes to work, so they work closer to home. The explanation that household responsibility shortens women's work-trips, coupled with the finding that women more often combine trips, lends credence to the contention in the first section of this chapter that women's multiple role responsibilities constrain their daily activity schedules. The result is that women's work opportunity is locally limited by time constraints proportionate to the degree of household responsibility.

There are two reasons why women use public transportation more and automobiles less: First, there is a concentration of low-income female-headed households in the city who do not own automobiles. Second, married women's rights to automobiles usage are usually subordinate to the husband's in one-automobile households (Kaniss and Robins, 1974).

These differences in travel behavior reflect the ways that women have adapted their multiple roles of mother-

wife-wage earner to the present transportation/land use system. What has been the response of transportation planning?

It is questionable whether existing transportation tools and models are adequate to provide for the needs of women. Recker, et al. (1978) found that travel demand forecasting models which rely on time and cost descriptors and/or base parameter estimation on total sample results, may exclude important aspects of travel choice for women. Hartgen (1978) concludes that present data and methods can be usefully applied to analyses of women's travel issues but that they have not been because of a shortcoming of emphasis. He says that the problem is that the methods are not subgroup oriented, and that they are insensitive to the causal structure of travel and to social policies. Kostyniuk and Cleveland (1978) give an account of how the inadequacy of presently used models can affect the entire urban transportation system. They found that in using the TALUS trip generation model there was an inherent over-prediction for households with no adult females and an under-prediction for households with females. Tracing this through the chain of urban transportation models, the mis-specification will be propagated through the entire process of trip distribution and modal split. Trips from zones with high levels of adult females will be under-estimated, leading to planning of systems with lower

capacities for these zones. Like Recker, et al., Kostyniuk and Cleveland also criticize the practice of considering trip distribution by treatment of both sexes together. They contend that since women's trips are generally shorter, the practice of combining the sexes for trip generation and distribution leads to planning an excess of transportation facilities further away from zones with a high number of adult females.

To sum, it has been shown that women's trip behavior is different from men's, and that there are complex social and economic reasons for these differences. It has been suggested that transportation planning practices do not account for these differences; and therefore have planned and are planning systems that are inequitable for women who want to work.

Residential/Employment Location

This section focuses on the physical relationship between residence and work place. And, specifically, how the balance between them can affect accessibility costs, and therefore, work behavior of women. The relation has two aspects. First, the impact that the increasing labor force participation of women is having on modern residential choices. The second aspect is the affect of employment/residential location on wive's labor force participation.

Roistacher and Young (1980) believe that three household types--the single woman, the two-earner family, and the household headed by a divorced woman--will shape the economy of cities by their impact not only on the labor market, but also on the demand for housing, tenure choice (whether to own or rent), and particularly on choice of residential location. The standard economic model predicts that the residential location decision is fundamentally a trade-off between the expense of commuting to work and the cost of space. The closer to a center, the lower the commuting costs; the farther from a center, the lower the cost of space. Income and family structure are key variables in determining the residential location of a particular household in the context of the above economic model. The model predicts a suburban location for the traditional family. For the two-earner family, transportation costs are more significant, thus the demand for centrality should increase. Female-headed households and single women are much more likely to live centrally (Roistahcer, Young, 1980; Gerard, McCormick, 1978). The economically rational results of the emerging household trends should be a decreasing rate of suburbanization of residences and a potential increasing reurbanization rate (Alonso, 1978; Ginzberg, 1978; Roistacher and Young, 1980). Madden (1981) suggests a transportation-oriented view of the situation. She says that the tendency of

women to make shorter work-trips is of particular concern to urban and transportation policy, since this behavior may ultimately alter trip distribution in cities by prompting further suburbanization of workplaces or a re-urbanization of residences. This would happen due to the increasing participation rate of women in the labor force and the predominance of work-trips as a portion of intra-urban trips. The truth of the matter is that for as long as the participation rate of women in the labor force has been increasing, so has the rate of suburbanization. The end result is baffling and unclear. It does, however, raise an important issue. That is: if increasing rates of female participation in the labor force will induce urban centralization, will the problems of inequality of access and nonfit between environment and behavior alleviate themselves? Maybe some, but certainly not entirely, since employment location has yet to be contended with. And it is the or imbalance between residence and employment which will need to be addressed.

There appears to be a generally sinister type of employment-residence mismatching trend occurring in American cities. Blue collar employment opportunities have been decentralizing to where the middle and upper classes reside, while white collar employment opportunities continue to centralize where low-income live in Central Business Districts (Saegert, 1980). The situation creates

problems of access to employment for both populations (certainly more serious for the former). Falcocchio and Cantilli (1974) conclude from a study that the decision threshold between working and not working for low-skilled workers (many wives fit this description) is largely dependent on the ease of access which they have to job opportunities. Kreps and Leaper (1976) found that women have tended to withdraw from the labor market rather than to engage in prolonged search in an unfavorable location in times of high unemployment. Several studies have cited accessibility as a major determinant factor affecting women's ability to combine home-related activities with pursuits outside the home (Maas and Kuper, 1974; Palm and Pred, 1977).

Studies have shown that women's employment is more local than men's (Kain, 1962; Madden, 1981). One explanation of this for married women is that the wife with the lower paying job is forced to choose a job from the residential location. The residential location has been chosen with her husband's job location as a primary consideration (Madden, 1981). A study in London showed that labor force participation among women varied directly with the availability of local, borough employment opportunity. It did not prove important for men (Hock, 1978).

Access to Services

Communities are increasingly taking over functions once performed by the family. The increasing growth of the service industry is evidence of this. Equal access to services is a concern for the entire population; however, two issues become dominant in context of women's participation in the labor force: dispersion and access to child care.

The first issue is the dispersal of services in suburbia. It has been shown in a previous section that women make many multi-purpose trips due to time constraints. This finding makes the coordination of service-connected trips with work trips a legitimate concern in planning for women's needs. Overall time in travel could be reduced if coordination is achieved. Reducing travel time is critical to working women with home responsibilities. Dispersal of services is seen as a detriment to women's labor force participation. Pray (1974) writes of the situation:

> . . . The only woman not unduly inconvenienced by the dispersal of specialized services in low density areas would be a nonemployed, childless woman who has access to her own automobile.

By definition, the character of low-density suburbs is a dispersed population. This makes it extremely difficult for specialized services to be located near the bulk of the residents.

The second concern in service access is child care. Quality child care is extremely important to working mothers. An important consideration for planners is that only between 10 and 15 per cent of all preschool children of working mothers are cared for by licensed day care centers, and that female-headed families and small families are more likely to use these centers (Moore and Hofferth, 1979). The majority of working mothers appear to be using personal arrangements (for example relatives) to care for their preschool children while they are at work. This fact could have an impact on the demand for space for child care facilities. So far as affects of the availability of child care on women's labor force participation is concerned, national data shows a higher incidence of working women with pre-school children in those families where an older child is present (U.S. Dept. of Labor, 1972). This suggests that the older child is available to care for the younger while the mother is at work; and further, that the lack of child care services (or a disbelief in their com petency) is a deterrent to women who might otherwise be employed (Pray, 1974).

Zoning ordinances often are obstacles to the facilitation of a child care facility in a residential area. Ordinances generally treat the child care center as a special exception use. Planners review the proposals on the basis of two primary criteria: (1) the safety of the

child, and (2) the protection of neighboring properties from nuisance factors which may be associated with such an operation. Pray (1974) argues that these are valid criteria, but the total perspective of the working mother is absent. The mother's concerns may include economic necessity to work and locational convenience.

There is a continuing debate over whether child care facilities should be placed near the home or at employment centers. With present zoning practices, the latter is easier to facilitate. The land-use associated with a day-care facility is commercial. It is technically more compatible with other commercial or industrial zones than with residential zones. While this may not seem logical from a social view, the important consideration for planners is to insure that child-care facility location is either near the home or the workplace. And that it is not located out-of-the-way where it will unduly inconvenience the parents of the child.

Income

The final issue addressed in this chapter is the effect of women's labor force participation on the distribution of household income.

First, the family income conditions that bear on the decision for a married woman to work must be discussed. Economists traditionally analyze household income in relation to the husband's income. Labor force participation

of wives tends to be negatively related to their husband's income, but positively related to their own earnings prospects (Mincer, 1962). The net result is that the labor force participation of wives increases as husband's earnings rise up to the average earnings for all husbands, but then falls again at higher levels overall. This, in effect, causes the current distribution of income to be somewhat more equal than it would be if wives did not work at all (Moore and Sawhill, 1976). The increasing participation rate of women in the labor force over the past 30 years has tended to reduce the relative inequality of family income when only husbands worked. Not only is wives participation in the labor force equalizing distribution of income, but it is raising it also. In 1980, two-wage earner families earned a median income of $25,552, while families with only the husband in the labor force earned $21,150 (U.S. Bureau of the Census, 1981). Many have said that the increasing labor force participation rate of wives has made it possible for many families to attain middle class status.

Income distribution and the equity questions that arise are at the center of the labor force participation/urban environment relationship. The question of whether location affects women's labor force participation is really: does location affect household income? This should be an important planning conern.

SUMMARY

Facilitating the labor force participation of women is, in effect, providing for the accommodation of new emerging households on the urban scene. Three aspects of the urban environment are seen to interact with female labor force participation: (1) male/female roles and the physical representation of those roles, (2) community design, and (3) accessibility to employment and services. These aspects form a complex interrelationship and continually reinforce each other. A comprehensive approach to planning for women's needs and two earner households needs would have to address all three aspects as a whole.

CHAPTER III

DATA AND METHODOLOGY

THE DATA

The major source of data for this thesis was the publications of the U.S. Census. Two separate data sets were collected. One data set was for the labor force profile of Knox County. These statistics were collected from the 1960, 1970, and 1980 Census of Population and Housing for Tennessee. The other data set contains information from the 1980 Knoxville SMSA Census Tract Publication. The analysis was performed on the latter data set.

The 1980 Census was conducted primarily through self-enumeration. A census questionnaire was delivered by postal carriers to random housing units several days before Census Day, April 1, 1980. The primary householder was requested to fill out the form and mail back the questionnaire on Census Day. Approximately 83 percent of the households did so. The Census tracts vary in area and population considerably, but the samples were reported to be consistently in the 15 to 17 percent range. Standard errors will vary with the population in the Census tract, and the particular question asked on the questionnaire. There are 79 Census tracts in Knox County; therefore, 79

observations in the data set. One census tract was deleted due to confounding and misleading information. It is the tract that contains the University of Tennessee. Due to the dominance of college students in the tract, its measurements were contrary to general trends in the county. For example, a high educational level was found with an extremely low labor force participation rate. This left 78 observations in the analysis.

Limitations of the Data

This thesis presents an exploratory cross-sectional study of an extremely dynamic and complex set of relationships. Conclusions will be based on observations made at only one point in time, in one place. This is an unfortunate limitation; but necessary due to the nature of the central variables--location and accessibility. A particular knowledge of the study area and access to pertinent information was required for the operationalization of these variables.

Another limitation is the relatively small sample size. In effect, 78 observations are analyzed in a city of 315,000 people. Nevertheless, the households are located in the center of each census tract, and it is their relative location and spatial distribution that is of interest.

THE VARIABLES

The variables in the analysis were selected based on prior research and theoretical considerations. The variables have been classified into six factors: 1) labor force participation, 2) location, 3)accessibility, 4) family composition, 5) employability, and 6) economic factors. Table 3.1 lists the variables and displays descriptive statistics.

Labor Force Variables

The labor force variables were the dependent variables in the analysis. Four variables were used. Each measured the labor force participation rate of a particular group of people. The participation rates were for total women, total men, women with children under six, and women with husband present. Participation of men was used as a bench mark for comparison. Labor force status needs clarification. According to the census, the labor force consists of all persons 16 years and over who were either employed or unemployed during the reference week the census questionnaire was taken. A person was considered employed if they were either (a) at work during the reference week, or (b) with a job but not at work. The person was considered unemployed if they (a) were neither (a) or (b) above, (b) were looking for work during the

Table 3.1. Descriptive Statistics of Variables.

Variable	N	Mean	Std Dev	Range
LFP-Female	77	49.7	7.86	29.8-64.9
LFP-W/child under 6	76	49.7	13.58	16.9-92.9
LFP-W/husband present	76	49.6	8.30	28.8-76.0
LFP-Male	77	72.5	10.45	39.3-91.7
Density	78	3.0	2.65	0.2-12.7
Distance-CBD	78	5.6	3.82	0-15.7
Distance-school	78	1.0	.80	0.1-4.5
Distance-shopping	78	1.7	1.65	0-9.3
Mean travel time	77	21.2	3.47	11.9-28.8
Employment density	78	1918.9	2973.97	32.0-19970.0
Age	78	34.6	6.90	22.8-58.1
Percent married	78	53.4	15.01	11.3-73.5
Family size	78	3.1	.28	2.41-4.5
Percent HS graduates	78	61.7	18.10	11.8-94.9
Female unemployment	78	6.9	4.34	0.6-21.8
Percent employed in CBD	77	10.4	3.91	0.7-19.7
Family income	77	17546.6	6440.6	4513.0-35607.0
Mobility	78	53.3	14.03	6.9-74.0
Total unemployment	78	6.5	3.61	2.2-17.9

LFP = Labor Force Participation

last four weeks, and (c) were available to accept a job, or (d) those who were "laid off."

All persons 16 years and over who are not classified as members of the labor force are defined as "not in the labor force." This category consists mainly of students, housewives, retired workers, seasonal workers in an "off" season, inmates of institutions, disabled persons, and persons doing only incidental unpaid family work (less than 15 hours during the reference week).

The labor force participation rate is calculated by dividing the labor force by the total number of members over sixteen in the census tract. It defines those that are "willing and able to work." It should be obvious from the list of possible people not in the labor force that there can be several reasons for a census tract having a low labor force participation rate. The tract may have a large retired population, a large student population, or even a large handicapped population. These would all cause low participation rates to show. The longitudinal profile was used as a check for all of the participation rates. If the rate was not in the 30 to 50 percent range it was examined closer. Two rates were dropped from the analysis after this check out of 312 rates (78 census tracts--4 rates per tract). The rates were usually low due to a high participation in school.

Locational Variables

The locational variables, along with accessibility, are the central focus of this research. The four variables are: density, distance to the central business district, distance to the nearest primary school, and distance to the nearest shopping center. These variables are intended to typify a residential location within the urban system. In general, it is expected that as the distances increase and density decreases, labor force participation of women will decrease. The variables measurement procedure and rationale for inclusion into the analysis follows:

1) Density. Density is measured in persons per acre. Figures are obtained from the Metropolitan Planning Commission of Knoxville. An important assumption with this variable is that public and private services increase with density. Examples would be public transportation, local day care services, health care, and so forth. Density is expected to be an important factor in labor force participation with children under six. Chapter Two discussed this relationship.

2) Linear distance (in miles) from the centroid of the census tract to the CBD. The distance was measured on a current census tract map of Knox County at 1:400 scale. This variable is seen to directly reflect suburban-city location. It is assumed that the further a household is

from the CBD, the less services that are available. More housewives should be present, or at least, women who are less interested in finding employment for whatever reason.

3) Linear distance from the centroid to the nearest public primary school. All Knox County and Knoxville public primary schools were plotted on the census tract map. The distance was measured in miles to the nearest school. A relationship was expected to be found between this distance and labor force participation of women with children under six.

4) Linear distance from the centroid to the nearest shopping center. Over sixty shopping centers were plotted on the census tract map. These centers were taken from a Knoxville News-Sentinel business article published in April of 1982. Distances were measured in miles. This variable has two functions. One, it is expected that given a choice, a woman will want to be near a conveniently accessible shopping area especially if she wants to work. (This would be expected because of time constraints and a need to maximize coordination. Two, it is shown in the next chapter that retail trade is a major emloyer of women. It is known from real estate economics that retail tends to aggregate. It was observed on the census tract map that the shopping centers tended to cluster on major arterials. These clusters, in effect, represent employment centers. If proximity to work is a

factor in labor force participation of wives, or in residential location choices of working couples, labor force participation of women would be expected to be higher around these centers.

Accessibility Variables

Two variables were included that indicate accessibility to employment: mean travel time to work and employment density in each tract. Labor force participation of women is expected to increase with accessibility to jobs.

1) Mean travel time to work. This variable, in minutes, is taken from the census. It is defined as the elapsed time between home and work. It includes time spent waiting for public transportation, picking up passengers in car pools, or time spent in other activities related to getting to work. Unfortunately the variable is not broken down by sex. It is a total workers median. Nevertheless, it should indicate those tracts that are farther away from employment centers. This is a valuable measure because it is in time units, which takes into account important factors besides mere distance, such as traffic congestion, or the performance of transportation networks.

2) Employment density. This variable is a measure of the total number of employees/jobs in each census

tract. The count is made by the Knoxville Traffic Engineering Department for transportation planning purposes. The totals were originally in traffic zones. Zones fit correspondingly into census tracts, so the summation to census tracts was accurate. This variable is intended to be a measure of local employment. There is a potential problem. Zoning is basically separation of home and work. This may prove dominent in the analysis. Those tracts with high employment will likely be zoned mostly commercial or industrial, and the result will be a small resident labor force. This is where it is necessary to remember that the labor force status is measured as a rate and not a number. Zoning should not matter. The participation rate of those women living in high employment tracts should be higher, based on prior research, unless the employment does not match the skills of the women. The employment-residence mismatch spoken of in Chapter II may dominate the relationship. The net effect being that women living in suburbs commute to the city to work. Women in the city must go to decentralized blue-collar jobs in the suburbs. Neither can take advantage of local employment.

Family Composition Variables

Family composition is perhaps the most researched and understood factor in the employment of women. Three

variables taken from the census are included in the analysis: median female age in the census tract, the percent that are married, and the average size of the family.

1) Age. This variable gives the analysis two indications. One, it should explain the general age of the population in the census tract. Most importantly, what is the chance of a high proportion of retired people in a particular tract. This could be a major cause of low participation in the labor force. Secondly, age gives an indication of the stage in family life cycle. Chapter Two has explained different planning concerns of different stages in this cycle.

2) Married. The percent married in a census tract gives a good description of the character of the neighborhood. It generally implies more home ownership, permanence, and stability. Labor force participation of married women is expected to be more dependent on access to employment.

3) Family size. This variable is a mean. It is expected to indicate the degree of household responsibility for married women. As this responsibility increases, labor force participation should become constrained at least, decrease at most. On the other hand, large families may show to exert more economic pressure on the mother to work. This would depend on the income of the father. The variable is also intended to indicate general

fertility. This relationship is discussed in Chapter IV. In general, as family size increases, labor force participation is expected to decrease.

Employability Variables

Employability refers to the characteristics of the labor supply. The degree to which the womens skills match labor demand. Three census variables have been chosen: female unemployment, percent high school graduates, and percent of workers that work in the CBD. The effect of employability on labor force participation well defined.

1) Percent high school graduates. This variable is expected to have a large positive effect on labor force participation. The measure includes persons who completed four years of high school as well as those who completed one or more years of college.

2) Female unemployment. Unemployment is that sector of the labor force that cannot find work. It includes people on welfare. The measure should vary with the state of the economy, and with the match of skills of the people with employment demand. Unemployment would be expected to increase in the city. As it increases it is expected that labor force participation will decrease. The relative ratio of female unemployment to labor force participation is a significant measure within each census tract, and across labor force categories (male, female, women with

children under 6, and women with husband's present). Unemployment and labor force participation are entirely different concepts. Impact on one does not necessarily affect the other. However, an assumption is made that the direction of causality (if there is one) will go toward labor force participation. Unemployment caused by economic factors, social factors, and worker non-employability will cause participation to decrease due to the "discouraged worker" theory.

3) Percent of workers employed in CBD. This is a total measure and is not broken down by sex. The Knoxville CBD is the largest employment census tract in Knox County. The employment is primarily white collar. The variable is intended to give an indication of the character of workers in a tract, as well as the significance of the CBD as an employer.

Economic Variables

Three variable are included in the analysis to describe the economic conditions of the family and the neighborhood. These variable are: income, mobility, and total unemployment.

1) Family Income. This variable is the most difficult to interpret. A family's income is raised by the woman participating in the labor force. But what level and circumstance prompts this decision? Is it really

valid anymore to base the decision on the husband's income? Perhaps wives work now as a matter of course, and not due entirely to economic necessity. On the other hand, maybe wives/mothers must work now to maintain a standard of living. A husband's income would have been a better variable but was not available.

2) Mobility. This census variable is measured by the percent of households that lived in the same residence in 1975. The data is based on one-half of the full census sample. It is included to be an indication of neighborhood stability and change. If a census tract has high labor force participation rates, and a low percent that lived there in 1975, then it could indicate a movement to favorable locations for employment. Further analysis would be required. The variable reflects directly on residential location.

3) Total unemployment. This variable is an indicator of the state of the economy and/or of employment shifts. It is expected to influence labor force participation a great deal.

THE ANALYSIS

The analysis consisted of two major parts; one part conducted on each data set. First, the Knox County Female Labor Force was examined from the years 1960 to 1980, and

then projected to the year 1995. This profile gave a clear picture of the entire mass labor force. Then, in the second part, the labor force was analyzed by census tract to examine their relations to each other and to the whole. The census tract analysis was performed by use of the Statistical Analysis System (SAS). Correlation and multiple regression techniques were employed. These techniques were conducted in three steps: 1) correlation, 2) exploratory multiple regression utilizing stepwise procedures, and 3) theoretical model-testing.

Labor Force Profile

The Knox County female labor force was examined from 1960 to 1980 to define historical trends. Pertinent labor force and social statistics were included. The present (1984) situation was then defined. Finally, projections for Knox County were made by occupation. Comparisons are made to the State of Tennessee and to the nation.

Correlation

The first step in the census tract analysis was to examine all correlations between the variables in a correlation matrix. This was necessary to define cases of covariance, and to pinpoint potential multicollinearity problems. Multicollinearity is an undesirable condition of highly correlated independent variables. It is common in social research.

Stepwise Regression Procedure

The next step was to build a model to explain the variance in female labor force participation. Stepwise procedures are suited for this type of exploratory analysis. The goal was to find which of the variables are significantly related to labor force participation. The stepwise procedure begins with none of the potential independent variables in the model. It adds each variable, one at a time, that has a pre-determined significance level until none are left that will make a significant partial contribution. At each step, after entering a new variable, the model drops any variables whose partial contributions are no longer significant at an predetermined significance level. With this procedure, a variable entered into the model at a particular stage may eventually be elimiated because of its strong relationship to other variables entered at later stages. Thus, high multicollinearity is better controlled and avoided.

Significance levels were set at .15 for entrance into the model, and for remaining in the model. It was desired to choose the model that provides the best prediction using the sample estimates. Therefore, it was only necessary to guard against estimating more parameters than can be reliably estimated with the given sample size. Goodnight (1982) suggests a moderate significance level of .10 to .25 for these concerns.

The stepwise procedure was run for each of the four labor force categories: men, women, women with children under six, and women with husbands present. Comparisons were made, and the best model for each category was chosen.

Theoretical Model Testing

The final step is to explain and interpret. Partial regression coefficients were examined for the four "ideal" models. Then focus was set on the locational and accessibility variables. The entire set of variables was divided into two groups. One contained the locational and accessibility variables, the other contained the socio-economic variables. Step-wise and straight multiple regression procedures were performed on each group for each labor force category. Comparisons were made to determine which group--locational/accessibility or socio-economic--explained the most variance in each labor force category. Then, the goal was to make a final determination as to just how much location/accessibility does relate to labor force participation holding socio-economic status constant.

To sum, the entire analyis has three objectives: 1) to determine what factors most affect a married woman's labor force participation, 2) to determine the

extent that location and accessibility affect this decision, and 3) to determine if female labor force participation is having an impact on residential location choices, thus city structure.

CHAPTER IV

A PROFILE OF THE KNOX COUNTY FEMALE LABOR FORCE

This chapter is a comparative longitudinal analysis of the female labor force of Knox County, Tennessee. The labor force is compared to the State of Tennessee's labor force from the year 1960 to the present. Then particular characteristics are projected to the year 1990. The general scheme is to define historical trends, then determine if these trends are expected to continue throughout this decade.

The analysis is a critical element of this thesis for several reasons. First, it provides insight into the mechanics of a labor force, and brings to life the relatively abstract trends discussed in Chapter 1. The analysis allows, in effect, the operationalization of these conceptual trends. Secondly, the analysis gives a clear picture of the labor force that is under study and defines the forces that are shaping its structure. This information aids in interpretation and understanding of statistical results. Third, the comparison of the labor force of Knox County with Tennessee and the nation will indicate the degree of transferability of the statistical results to other labor forces in other economies. Is this local labor force unique or different in any way? Or is

it in keeping with national trends. These questions are put forth in the light of the fact that employment and labor force participation are regional phenomena. The exact relationship between employment and labor force participation will vary with demographic characteristics of the local population, labor skills, and the regions economic base. Participation is the link between the labor market and industry. What follows, in this chapter, is a focus on this link for the women of Knox County.

HISTORICAL TRENDS

The increasing rate of female labor force participation and the reasons for its increase were discussed in Chapter 1. A detailed sequential history of this increase at this point would add to an understanding of the entire phenomenon. It is informative and quite interesting to note how the rate increase has occurred. The phenomenon has been studied in detail on the national level (Chafe, 1976). It is assumed that the labor force of Knox County has tranformed in the same manner.

A glance at the history will show that World War II stands as the breaking point from traditional values of women and labor. Female employment at this time became a national necessity. From a social point of view, the most important fact about this phenomenon is that the women who went to work were married and over 35 years old. Surveys

were conducted at the time and it was found that many of the workers enjoyed their jobs and new roles. The underlying changes brought about by the war remained in effect and continued to develop. Female employment continually increased. A large portion of the increase came initially from this middle-aged group. The median age of female workers rose from 32 to 36.5 between 1940 and 1950.

In retrospect, there appears to be a simple cultural logic at work in the employment pattern of women since World War II. The middle-aged women who first broke the social barriers against married women's employment represented the least threat to traditional ideas. Questions concerning the future of the family or the impact of working mothers on young children were not aroused. It was acceptable for middle-aged to older women to enter the labor force. But then, participation began to filter down into other ages and family situations. During the early sixties a major increase in employment occurred among mothers with children 6 to 17 years of age. By the late sixties and early seventies, in turn, the major change took place among mothers of younger children. This change has been the most recent, and one whose effect is still prevalent. It has been as though each step in the process--the employment of middle-aged women, then women with children 6-17 years of age, and then women with

children under six was necessary to prepare the way for the social acceptance of the next step. Traditional ideas that 'a woman's place is at home' have been stripped. Women's labor patterns are rapidly approaching men's: one works from school completion to retirement. The family life cycle is becoming less a prediction of labor force participation of women.

Table 4.1 shows female labor force participation rates for Knox County and Tennessee. Both labor forces show increasing rates, which is consistent with national trends. It is evident from Table 4.1. where the real increases in participation have been made between 1960 and 1980. The highest percentage increases have been from women with children under six years: 47.4 per cent increase for Knox County from 1960 to 1970, 38.9 percent increase for Tennessee; and a 45.2 percent increase for Knox County from 1970 to 1980, 37.7 percent increase in Tennessee. It is significant that the percent changes have decreased from 1970 to 1980 after peaking from 1960 to 1970. This shows that the largest percent changes have been made, and while the rate will continue to increase, the rate of change will stabilize.

Knox County appears to have lower participation rates for women with children under six than the average for the state. This probably reflects a lag behind the effect of

TABLE 4.1. Female Labor Force Participation By Marital Status, Children Under 6 In Household, and Total: 1960-1980, Knox County and Tennessee.

	1960		1970		1980	
	Knox Co.	TN	Knox Co.	TN	Knox Co.	TN
Married, husband present	32.2	31.5	40.5 (25.8)[a]	41.7 (32.4)	50.6 (24.9)	50.6 (21.3)
Children under 6 in household	21.3	25.2	31.4 (47.4)	35.3 (38.9)	45.6 (45.2)	48.6 (37.7)
Total	34.4	32.8	39.9 (16.0)	41.1 (25.3)	49.5 (20.4)	48.9 (19.0)

a. Indicates percent change from previous census year.
Source: U.S. Census Bureau.

the larger metropolitan areas of Nashville and Memphis. Knox County appears to be 'catching up' since the rate of change is 8.5 percent higher from 1960 to 1970 and 7.5 percent higher from 1970 to 1980 for women with children under six.

Table 4.2 provides different picture of the female labor force for the twenty year period. Age-group comparisons reflect more directly on the population characteristics than the previous table, which reflected social characteristics. Three trends are important from Table 4.2. The first is the consistently high percentage increases in participation from women's ages 18-24. The second is the relatively high increase between years 1970 and 1980 for the 25-44 age group--27.1 percent for Knox County and 22.1 percent for Tennessee. The third important trend is the decrease in labor force participation among the older age groups 45-64 and 65 and over. The percent change in the 45-64 age group is probably influenced greatly by those over 55.

These trends are for the most part explained by the aging of the baby boom generation and the increasing population of the 55 and older age group. During the sixties and seventies, the fastest growing age group was the youngest--ages 16-24. These women were the baby boom generation initially entering the labor force. The

Table 4.2. Female Labor Force Participation By Age: 1960-1980, Knox County and Tennessee.

	1960		1970		1980	
	Knox Co.	TN	Knox Co.	TN	Knox Co.	TN
18-24	44.0	41.7	52.0 (18.2)[a]	44.7 (312.2)	63.7 (22.5)	64.6 (18.1)
25-44	40.6	40.9	48.7 (20.0)	51.5 (25.9)	61.9 (27.1)	62.9 (22.1)
45-64	40.0	37.1	46.1 (15.3)	45.0 (21.3)	41.7 (-9.5)	39.2 (-15.0)
65-	9.7	8.9	10.2 (5.2)	9.6 (7.9)	6.5 (-36.3)	8.0 (-16.7)

a. Indicates percent change from previous census year.
Source: U.S. Census Bureau.

percent increase in the 25-44 age group from 1970 to 1980 is already beginning to show the aging of this generation. This reflects a general aging and stabilization of the entire labor force. The baby boom generation is pushing at one end. While the aged population is expanding at the other. This is causing the participation rate of the 55 and older labor force to decrease. The portion of jobs available to this segment of the labor force remains the same.

The effect of the baby boom generation on the structure of the labor force indicates the reactive response of the labor force to the demographic structure of the population. Table 4.3 shows three other pertinent characteristics of the population: fertility, percent high school graduates, and percent non-married couple families. Fertility peaked in 1970 and has decreased 11 percent to 1980 for Knox County and Tennessee. This decrease is seen as a result of the increasing rate of participation. The percent of female high school graduates has steadily increased at a tremendous rate over the twenty year period. Knox County is well above the state with 18.6 percent more high school graduates in 1970 and 7 percent more graduates in 1980. These figures indicate a higher educated labor force than Tennessee. Fertility figures show a significantly lower fertility rate--186 children

Table 4.3. Fertility, Female High School Graduates (percents) and Non-married Couple Families (percents): 1960-1980, Knox County and Tennessee.

	1960		1970		1980	
	Knox Co.	TN	Knox Co.	TN	Knox Co.	TN
Fertility children ever born to women 34-44 per 1000 women	2476	2732	2803 (13.2)[a]	2989 (9.4)	2491 (-11.1)	2640 (-11.7)
High School Graduates	24.4	20.5	50.4 (50.8)	31.8 (55.1)	62.8 (24.6)	55.8 (75.5)
Non-married couple families	13.4	13.4	13.8 (3.0)	13.5 (.7)	14.5 (5.1)	14.3 (5.9)

a. Indicates percent change from previous census year.
Source: U.S. Census Bureau.

per 1000 women less in 1970, and 149 less children per 1000 women in 1980. The two characteristics combined--fertility and education--indicate a more active and employable labor force than the state. This is, however, expected from a metropolitan area in a largely rural state.

Finally from Table 4.3, as an indicator of changing family composition, the percent of families that are not married couples is shown. These families are increasing, but not at the expected rate that has been experienced at the national level. These families are assumed to be mostly headed by women. There has been an increase of 8.2 percent over the twenty year period for Knox County and a 6.7 percent increase for Tennessee. This rate of change will increase with the amount of urbanity of the state or region.

Table 4.4 shows the primary occupations of the female labor force, and its structure over the twenty year period. The female labor force is traditionally concentrated in the retail sales, nondurable goods manufacturing, clerical, and service occupations. Included in nondurable goods manufacturing is food and kindred, textile, etc. The table shows that the largest concentration of women is in the clerical occupations--23 to 30 percent consistently throughout the twenty year period.

Table 4.4. Female Occupational Participation of the Employed: 1960-1980, Knox County and Tennessee.

	1960		1970		1980	
	Knox Co.	TN	Knox Co.	TN	Knox Co.	TN
Professional, technical and related	14.4	12.2	17.0 (18.1)[a]	14.1 (15.6)	18.8 (10.6)	16.4 (16.3)
Sales Workers	7.4	7.1	6.7 (-9.5	6.3 (11.3)	11.4 (70.1)	10.4 (39.4)
Retail	6.6	6.4	5.4 (-18.2)	5.3 (-17.2)	8.8 (63.0)	7.9 (49.1)
Operatives Except transportation	18.2	20.2	16.0 (-12.1)	22.7 (12.4)	17.2 (-17.5)	19.6 (-13.7)
Non durable manufacturing	14.6	14.8	12.5 (-14.4)	15.3 (3.4)	12.2 (2.4)	15.8 (3.3)
Clerical	24.9	23.3	30.8 (18.9)	27.3 (19.3)	29.3 (-4.9)	27.2 (-2.2)
Service	13.4	13.2	17.5 (30.6)	15.5 (17.4)	16.7 (-4.6)	15.3 (-1.3)
Total Employed	31405	403218	40950 (30.0)	54604 (39.5)	61232 (49.4)	821053 (45.9)

a. Indicates percent change from previous census year.
Source: Metropolitan Planning Commission.

What is most striking about Table 4.4 is the 1970-1980 decrease in service, clerical, and operatives occupations and increase in professional-technical, and sales occupations. The sales and retail sales occupations show a decline from 1960 to 1970, and then a tremendous increase of 63.0 and 49.1 percent for Knox County and Tennessee respectively. These figures indicate a recent shift to retail sales and professional and technical occupations. It shows a decrease in low-pay, unskilled concentration of female labor. The increase in percent high school graudates discussed previously is further evidence of this trend.

Occupation participation is not only an indication of the quality of the labor force, but it is also an indicator of the major industries in a region and shifts of these industries. Recent shifts from 1970 to 1980 suggest that white collar employment in Knox County and Tennessee is increasing and blue collar employment is decreasing. Occupational mobility (changing occupations) is very limited to meet these shifts of industry. When they do occur, it will most likely be within their general type of employment. Blue collar will not switch to white and vice versa. Therefore, it is assumed that if a particular occupation is decreasing in participation, then that in putting women out of work. For example, participation is

clerical occupations decreased 4.9 percent in Knox County from 1970 to 1980. This represents a 4.9 percent decrease in labor force participation. These women are out of jobs. People stick to their occupations, in general.

Summary of Trends

Trends between Knox County and Tennessee over the twenty year analysis period are similar and in agreement with national trends. The highest increases in female labor force participation rates is observed for women with children under six, and for women in the 25-44 year age group. Labor force participation for women in the older age group 45 and over is decreasing. Pertinent social indicators are that fertility is decreasing, percent high school graduates is increasing, and percent of non-traditional families is increasing. White collar employment is increasing while blue collar employment is decreasing. The female labor force is increasing mostly in the professional, technical, and sales occupations.

PRESENT-1984

The January 1984 labor force participation rate of Knox Count is estimated by the Tennessee Department of Employment Security to be around 53 percent. Over half of the women in Knox County aged 16 and over are able and

willing to work. Based on trends the labor force participation of married women can be expected to be even higher. The Knox County Metropolitan Planning Commission estimates that 40 percent of the total local labor force is female. The female unemployment rate was 11.6 percent in January 1984 and the male unemployment rate was 8.2 percent. Table 4.5 shows the current portion of total employment in each occupation, and the percent of that occupation that is female. Professional and technical occupations account for 16.4 percent of total employment. These occupations are 41 percent female. Clerical occupations account for 16.9 percent of total employment. Women represent 72 percent of these occupations. These three occupational categories represent a full third of total employment in Knox County and they are highly participated by women. Operatives account for 12.6 percent of total employment and is 50 percent female. Service workers represent 12.2 percent of total employment and are 56 percent female. These figures indicate that Knox County has a very favorable employment climate for female labor force participation. And with the increasing trend towards white collar employment, the climate will become even more favorable.

Table 4.5. Female Percent of Occupations: 1984, Knox County.

	Per Cent of Total	Per Cent Female
Professional, technical and related	16.4	40.8
Sales workers	8.2	32.3
Retail trade	4.1	52.2
Clerical	16.9	71.9
Operatives	12.6	49.7
nondurable goods manufacturing	7.2	68.3
Service workers	12.2	56.4
Private household workers	1.8	97.1
Craft persons	13.6	a
Managers, administrators	9.1	16.8

a. Figures not available.
Source: Metropolitan Planning Commission

FUTURE

Local employment projections are clouded by uncertainities. Due to the nature of employment, the larger the scale of analysis for projection purposes the more accurate the results. Therefore, it is much more meaningful to use quality projections on a national scale than to use local estimates based within limited budgets and expertise.

Table 4.6 shows labor force projections by sex and age to the year 1995. In developing the projections, the Bureau of Labor Statistics used demographic and economic assumptions about the labor force based on trends. They then applied participation growth trends to Bureau of the Census population projections to attain labor force projections. Several pertinent observations can be made regarding these projections (Fullerton and Tschettier, 1983):

1) the total labor force will grow more slowly during this decade than during the 1970's.
2) Women will account for a greater proportion of labor force growth (nearly two thirds) than they did over the past decade.
3) the younger members of the labor force, ages 16 to 24, will decline in absolute numbers.
4) the number of prime-age members of the labor force, those ages 25-54, will grow faster than the total labor force.
5) participation of the aged will continue to decline.

Table 4.6. Civilian Labor Force By Sex, Age: 1980-1982, and Middle Growth Projection to 1995.

	Participation Rate			
	1980	1982	1990	1995
Total, age and over	63.8	64.0	66.9	67.8
Men	77.4	76.6	76.5	76.1
16-24	74.4	72.6	74.7	74.5
25-54	94.2	94.0	93.8	93.4
55-64	72.1	70.2	65.5	64.5
65 and over	19.0	17.8	14.9	13.3
Women	51.5	52.6	58.3	60.3
16-24	61.9	62.0	69.1	71.6
25-54	64.0	66.3	75.6	78.7
55-64	41.3	41.8	41.5	42.5
65 and over	8.1	7.9	7.4	7.0

Source: Bureau of Labor Statistics, Department of Labor.

A reliable means to attain future local labor participation estimates is to project occupational categories based on industry output. Table 4.7 shows these figures. It is evident from this table that as the female labor force expands throughout this decade, the jobs will be there to accommodate it. Professional and technical positions are projected to increase 9.6 percent with health technicians projected to increase 25.5 percent and medical workers (nurses) 19.1 percent. Service workers, sales, and clerical occupations are projected to increase 15.1, 10.8, and 11.3 percent over the projection period respectively. These occupations are heavily employed by women. Operative and crafts occupations show relatively low projected increases, again, indicating the trend toward a service-dominated society and away from manfacturing. This is a favorable projection for the female labor force.

This overview analysis of the structure of a local labor force has met its goals. A broader in-depth picture has been provided. It shows that the Knox County female labor force is very typical, and statistical results may be transferable to other similar economies.

Table 4.7. Employment Projections By Occupation: 1984-1990, Knox County.

	Employment		Change	
	Estimated 1984	Projected 1990	1984-1990 Absolute	Percent
Total, All Occupations	171,560	187,210	15,660	9.1
Professional, Technical and Related	25,710	28,190	2,480	9.6
Medical Workers	4,100	4890	790	19.1
Health Tech.	3,380	4250	870	25.5
Teachers	6140	5970	180	-2.9
Managers, Officials	15930	17420	1490	9.3
Sales workers	12490	13830	1350	10.8
Clerical Workers	31520	35070	3560	11.3
Crafts & Kindred	20960	21950	990	4.7
Operatives	23770	24740	980	4.1
Semiskilled Textile	750	750	0	-0.5
Semiskilled Packing	1620	1700	90	5.2
Server and Stitches	3940	3580	360	-9.1
Nondurable Goods Food and Kindred	570	550	20	-3.4
Service Workers	26010	29930	3930	15.1
Cleaning Serv.	5350	6100	760	14.1
Food Service	11170	12930	1770	15.8
Health Serv.	3170	4050	890	27.8
Personal Serv.	2280	2520	240	10.5

Source: Tennessee Department of Employment Security

CHAPTER V

RESULTS, DISCUSSION, CONCLUSIONS

CORRELATION

The first section in this chapter examines correlation among variables in the analysis. Table 5.1 shows correlation coefficients between the four labor force categories and the independent variables. The results give a preliminary look at possible relationships. After this discussion, intercorrelation among the independent variables is reviewed.

Location and Labor Force Participation

The most significant associations occur within density and distance to CBD. It appears that for most of the labor force, participation increases with distance from the CBD, and decreases with density. The strongest association occurs in the male labor force (-.66 with density, .68 with distance to CBD). The total labor force for women and that for married momen behave similarly. Participation of women with children under six is associated in an opposite manner from the rest. Participation in this category increases with density and decreases with distance from the CBD. This association is what was expected of the entire female labor force. Further observation shows that this labor force is

Table 5.1. Correlation Between Dependent and Independent Variables.

	LFP Women	LFP Husband Present	LFP Child 6	LFP Men
Density	.25	-.13	.25	-.66
Distance-CBD	.30	.27	-.20	.68
Distance-School	.08	.11	-.18	.35
Distance-Shop	-.08	-.00	-.10	.20
#Employ. in C.T.	-.25	-.27	-.10	-.40
Travel Time	.12	.20	-.07	.36
Female Age	-.44	-.35	.20	-.31
Total Age	-.30	-.26	.18	-.04
Married (%)	.42	.37	-.13	.82
Family Size	-.02	.00	-.33	.29
Education	.44	.66	.05	.67
Work in CBD (%)	-.00	-.00	.02	-.08
Female Unemploy.	-.52	-.37	.22	-.54
Family Income	.47	.30	-.13	.80
Total Unemploy.	-.59	-.49	-.15	-.65
Mobility	-.14	-.12	.04	.13
LFP-Women				
LFP-Husband Present	.83			
LFP-Child 6	.35	.42		
LFP-Men	.70	.50	-.04	

(_) Indicates statistical signifiance at .05 level.
LFP = Labor Force Participation

unique. It is negatively associated with distance to schools (-.18), while the other three are positive, and it is more strongly associated with distance to shopping centers than the other two female categories (-.10 to -.08 and -.00).

The association is as hypothesized for distance to schools; as distance between residence and primary schools increases, labor force participation of women with children under six decreases. However, the association is not strong or statistically significant. The fact that distance to schools is negatively related to participation of women with children under six, while the other three labor force categories are positively related gives the reation some credability.

The locational correlations suggest that the bulk of the labor force (male and female) live in the suburbs or county. Labor force participation decreases in the city, with one very important exception: women with children under six.

Accessibility and Labor Force Participation

Each labor force category is negatively associated with the number of employees in the resident census tract. This indicates a negative association with local employment opportunities. The coefficients are contrary to what was

expected based on prior research. Another source of contrary correlations is travel time to work and labor force participation. All but women with children under six have positive associations with this variable. As travel time increases, labor force participation increases. A negative correlation can be observed for women with pre-school children.

In general, with the possible exception of women with pre-school children, accessibility appears to be negatively related to labor force participation. Men and women increase participation in relatively inaccessible areas, as accessibility has been defined and measured in this thesis. An explanation will be offered when correlations among the independent variables are discussed.

Family Composition and Labor Force Participation

There are high correlation coefficients within family composition. Participation of women with children under six continues to have opposite association that the other three labor force categories. Age is negatively associated with labor force participation. As one gets older one is less likely to be in the labor force. However, it appears that the older a woman is who has a child under six, the more likely she is to be in the labor force. The coefficient is .20 and is not statistically significant. The relation can

be explained by the probability that if a woman puts off childbirth until later years, she has a career to attend, or a necessary income to maintain, thus will more likely be working.

In those census tracts with higher percentages of married women, labor force participation appears to increase. Positive strong associations of .42 and .37 can be observed in the women category and the married women category. A non-significant negative correlation is observed for women with pre-school children. A very strong positive association is evident in the male labor force. This latter relationship conforms to common sense. The association in the women's categories are baffling. The results probably do not mean that married women are taking over the labor force. The resemblance to the male labor force is, however, quite inviting. The issue will be addressed again in the next section when the total picture can be approached.

Family size appears to be strongly negatively associated with participation of women with pre-school children. As family size increases, labor force participation of these women decrease. The presence of pre-school children apparently makes the family size/home responsibilities relationship much more significant. Family size is positive with male participation and non-significant with the other two female categories.

As expected, family composition has significant affects on labor force participation. Participation will decrease with net age of a man or a woman, increase with percentage married, and decrease with family size for women with pre-school children.

Employability and Labor Force Participation

Employability and earning potential appear to be positively related to labor force participation, as expected. Education is strongly positive with participation except for the women with pre-school children category. As female unemployment increases labor force participation decreases in all categories. The uniqueness of the women with pre-school children labor force is again pointed out. Education does not appear to be a factor in this woman's work decision.

Economic Factors and Labor Force Participation

The most striking feature in these correlations is that income is strongly positive with all but the women with pre-school children labor force. Income is weakly negative with these women (-.13). Participation in the labor force raises income. Or people with higher incomes are more likely to be in the labor force. The sign and the quantity of the correlation coefficient for women with pre-school children is important. It's negative, indicating that

low-income forces women with pre-school children to work. But the association is weak and non-significant making inferences to the population difficult. By mere quantity and the desirability of statistical significance, it is assumed that density, family size and female unemployment are more strongly related, or have a stronger effect on labor force participation of women with pre-school children than does income. The implications of this statement are discussed later.

Unemployment as an economic indicator has the expected negative effect on labor force participation. It is surprising, however, that it is strongest in the male labor force, and weakest in the women with pre-school children category.

The mobility variable did not turn out to be significant. A positive coefficient implies stability. For the male labor force, participation increased in those areas where a higher percentage of residences were the same in 1975. The coefficient is negative for women and married women's labor force participation and nonsignificant.

Correlations Between Independent Variables

Table 5.2 shows a correlation matrix for the independent variables in the analysis. Several points are to be made from this information. First, there is a high degree

Table 5.2. Correlation Between Independent Variables.

	Density	Distance CBD	Distance School	Distance Shop	#Employed in C.T.	Travel Time	Age	Female Age	Married %	Family Size	Education	Worked in CBD %	Female Unemploy.	Income	Total Unemploy.	Mobility
Density																
Distance-CBD	-.69															
Distance-School	-.52	.62														
Distance-Shop	-.51	.61	.43													
# Employed in C.T.	.10	-.36	-.19	-.23												
Travel Time	-.40	.65	.44	.47	-.52											
Total Age (M)	-.00	-.06	-.02	-.03	.01	-.15										
Female Age	.17	-.25	-.12	-.14	.17	-.15	.93									
Married (%)	-.75	.77	.46	.43	-.48	.56	.04	-.26								
Female Size	-.28	.39	.28	.21	-.42	.73	-.20	-.03	.29							
Education	-.32	.39	.14	-.10	-.14	-.01	-.01	-.26	.45	-.29						
Work in CBD (%)	-.03	-.24	-.14	-.15	.06	-.16	.10	.15	-.10	-.09	-.10					
Female Unemploy.	.37	-.37	-.21	-.11	-.00	-.05	-.27	-.17	-.35	.31	-.68	.00				
Income	-.59	.62	.28	.09	-.30	.25	.21	-.01	.68	.19	.83	.04	-.62			
Total Unemploy.	.46	-.49	-.28	-.17	.10	-.09	-.12	.01	-.52	.17	-.80	-.03	.89	-.73		
Mobility	-.33	.11	.16	.23	-.43	.35	.45	.31	.38	.33	-.22	.09	.06	.11	.07	

(__) Indicates statistical significance at .05 level.

of association among the locational and accessibility variables. Distance from the CBD is strongly associated with low density, increased distance to schools, longer distance to shopping centers, low employment density, and longer travel time to work. There is a set pattern. The variables, in effect, all combine and reduce to a fundamental centralized vs. non-centralized locational issue. The -.36 correlation coefficient between employment in census tracts and distance to CBD implies that employment in Knoxville is highly centralized in the city. In the previous section, it was shown that labor force participation increases and is stronger in the suburbs. Travel time to work increases with distance to CBD and with labor force participation. It is evident that Knoxville's labor force is typical in that it lives predominantly in the suburbs and works in the city. The female labor force does not appear to change this pattern. If it were, opposite relationships with accessibility and location would be found. These relationships are found, to a limited extent, in the women with children under six labor force. These women do appear more susceptible to locational influences.

The second point concerns residential location. The standard residential location model (Kain, 1962) has much support. The spatial pattern appears correct. As distance increases from the CBD, family income increases, density

decreases, family size increases, and percent married increases. The assumption made by Kain and others that work accessibility is the primary factor in residential locational choices is seriously questioned from this data. If it were the case, why would accessibility as measured in this analysis decrease with labor force participation? Women's employment was expected to be local. Thus far, there is no evidence of this. Accessibility correlations provide more evidence for the employment mismatch discussed in Chapter II. Women in the city work in decentralized blue collar occupations, while women in the suburbs work in centralized white collar occupations. Neither group can effeciently utilize local employment and both will have increased travel time to work.

The final point to be made is the strong association between education, unemployment, and family income. There was a temptation to combine these variables into one dummy variable for the regression analysis. But each variable was, in the end, considered too theoretically important to exclude. The variables are each quite different concepts. The possible negative effects of multicollinearity were sacrificed in order to provide these explanations in the analysis. The regression analysis is not concerned with prediction, but explanation.

STEPWISE REGRESSION PROCEDURE

No variables were deleted entirely from the analysis. However, percent married was restricted to the total female and male labor force categories only. The testing of how percent married is related to married women does not make theoretical sense. The results from the stepwise procedures performed on each labor force category is shown in Table 5.3. Some terms should be defined to aid comprehension of the tables throughout the rest of this chapter.

Adjusted R^2 is a version of R^2 (proportion of explained variance of the dependent variable) that has been adjusted for degrees of freedom. It is calculated:

$$R^2 = 1-(1-R^2)(n-1)/dfe$$

Where dfe is the degrees of freedom for error.

Parameter estimate is the partial slope for the relationship between the dependent variable and respective independent variable controlling for the other independent variables. This value is standardized on a scale of -1 to +1 under "standardized coefficient."

Standard error of the model, or of the regression, describes how for the average dependent variable departs from its forecasted value. It is a measure of the true standard deviation of those forecast errors (Acken, 1982). This standard error has the same unit of measure as the

Table 5.3. Labor Force Participation (LFP) Models from Stepwise Selection Procedure.

	ADJ R^2	Parameter Estimate	Standard Error	Significance	Standardized Coefficient
MODEL LFP/WOMEN	.64			0.0001	
#Employed in C.T.		-0.00	0.00	0.0169	-.18
Distance-Shop		-1.02	0.37	0.0069	-.22
Age		-0.60	0.10	0.0001	-.49
Education		0.09	0.05	0.1030	.19
Female Unemploy.		-0.91	0.20	0.0001	-.50
Model LFP/Men	.80		2.53	0.0001	
Married		0.47	0.04	0.0001	.66
Education		0.24	0.03	0.0001	.39
Model LFP/Women W/Child 6	.21		4.93	0.0004	
#Employed in C.T.		-0.00	0.00	0.0357	-.25
Distance-CBD		-0.93	0.48	0.0555	-.26
Family Size		-37.68	9.25	0.0001	-.60
Travel Time		1.63	0.69	0.0207	.40
Model LFP/Women W.Husband Present	.48		3.47	0.0001	
Density		0.67	0.44	0.1340	.22
Age		-0.41	0.15	0.0094	-.31
Education		0.38	0.11	0.0013	.80
Mobility		0.15	0.07	0.0323	.25
Travel		0.68	0.24	0.0062	.28
Income		-0.00	0.00	0.0130	-.58
Total Unemply.		-0.84	0.36	0.0225	-.36

dependent variable. It is calculated as the square root of the coefficient of variance term on the computer printout. The lower this value, the better the "fit" of the regression.

The statistical significance value is the attained significance level. This value is compared with .05 (the accepted significance level) to determine if inference can be reasonably applied to the population. In statistical terms, it is the probability that a F ratio (in the case of the model) or a t ratio (in the cases of each partial regression) will be as large as the one attained if the null hypothesis were true, or if the variables were independent of each other.

Labor Force Participation of Women

Out of the 15 variables entered into the stepwise procedure, 5 met the .15 significance level. These five variables account for more of the variance in the labor force participation of women than any other combination of variables. 64 percent of the variance is "explained" by this model:

> LFP/Women = f (# employed in the census tract, distance to shopping centers, median female age, education, and female unemployment)

Female unemployement has the highest partial regression coefficient of -.50. The implication is that labor force participation of women is most heavily influenced by female

unemployment--an employability factor. Education had the highest single r^2 with this labor force category (.43) performed separately in a bivariate analysis. The effect of multicollinearity is apparent on education. Statistical significance and the partial coefficient are affected. But, again, for explanation purposes it is critical to retain both education and unemployment in the model. The important point is that employability is the most critical factor in this labor force category. This is a reasonable finding. Labor force participation of women is highly influenced by single women. Single women's labor force behavior should approximate the main stream. In agreement with this assumption, age appears in the model with a coefficient of -.49.

Two variables with implications of location remained in the model. Controlling for employability of age, distance to shopping centers and the number employed in the census tract attained statistical significance. Both coefficients are negative. The reasons for the negative accessibility relationship has been discussed. The implication for the distance factor is that as proximity to shopping centers increases, labor force participation of women increases.

Labor Force Participation of Men

Two variables entered and remained in the model: married and education. They explained 80 percent of the

labor force participation variation. It is important to note that no locational or accessibility variables are in the model. Location and accessibility apparently are not significant factors in male labor force participation.

Labor Force Participation of Women With Children Under Six

This model has a low R^2 and high standard error. Apparently a "good fit" could not be found. The best fit contained four variables:

LFP/Women w/child under 6 = f (employment on census tract, distance to CBD, family size, travel time)

Family size has the greatest effect in participation of these women, -.60. Distance to the CBD made it into the model rather than density. As this distance increases, participation decreases. Women with pre-school children are more likely to work if they live in the city.

Both accessibility variables are in this model, and both reflect the negative relationship which has been discussed. This evidence indicates that this segment of the labor force is more susceptible to this accessibility dilemma. The association of these women's participation with accessibility is stronger than in other models. Compare the census tract employment coefficient of -.25 to -.18 in the women category, and the travel time coefficient of .40 to .28 in the married women category.

Labor Force Participation of Women With Husbands Present

Seven variables entered this model; 48 percent of the labor force variance is explained by these variables.

> LFP/Women with husbands present = f (density, age, education, mobility, travel time, income, total unemployment)

Education has the greatest effect on married women's participation. Controlling for the other independent variables, the regression coefficient is .80. It is definitive that income entered the model and none of the others. A strong negative partial correlation of -.58 exists between the two. As family income decreases the probability of a wife working increases. The model shows that total unemployment rather than female unemployment was found to explain more of the labor force variance. This indicates more of a reaction to the economy rather than to female employment potential. These women are defined as being less mobile by the presence of the mobility variable in the model. And finally, density and travel time enter the model indicating where these women live--the suburbs. It is assumed that density did not attain significance due to its high degree of correlation with income, unemployment, and education.

To sum the results of the full stepwise procedures before going on, it would be useful to point out the relationships that bear directly on the central hypotheses of this thesis.

1) Distance to shopping centers significantly effects labor force participation of women. A partial correlation of -.22 was found.
2) Labor force participation of women with preschool children is more significantly effected by accessibility than other labor force categories.
3) Location and accessibility are more significant factors for female labor force participation than for men's.

THEORETICAL MODEL TESTING

This section involves creating purely theoretical models using stepwise procedures. A locational model and a socio-economic model is found for each female labor force category. The effort is to find which locational variables are significantly related to participation. Then to put these variables into a model with the most significant socio-economic variables. The process should measure the degree of interference between the two groups, and tell which locational variables remain significant.

Table 5.4 shows the most significant locational variables for each female labor force category. Distance to shopping centers and distance to CBD appear significantly in

Table 5.4. Locational/Accessibility Models for Female Labor Force Participation (LFP).

	ADJ R^2	Parameter Estimate	Stand and Error	Signi-cance	Stand-ardized Coef-ficients
Model LFP/Women	.17	-1.96	3.79	.0003	
Distance-Shop		-1.96	0.62	.0025	-.41
Distance-CBD		1.13	0.27	.0001	.55
Model LFP/Women W/Child 6	.05		5.16	.0268	
Density		1.29	0.57	.0268	.25
Model LFP/Women W/Husband Present	.11		3.97	.0078	
#Employed in C.T.		-0.00	0.00	.0755	-.21
Distance-Shop		-1.29	0.68	.0615	-.26
Distance-CBD		0.77	0.31	.0155	.35

the model for women. The variables explain 17 percent of the participation variance.

The model for women with pre-school children contains density only. The effect is significant but explains only 5 percent of the variance.

Three variables entered the model for women with husbands present: employment in census tracts, distance to shopping centers, and distance to CBD. Distance to CBD is the only significant variable.

Table 5.5 shows the most significant socio-economic variables. The explained variance is much higher in each category. 62 percent for women, 11 percent for women with children under six, and 46 percent for women with husbands present. The R^2's for women and married women approximate the stepwise models where all variables were added at once. The R^2 for women with children under six does not. It explains only half of this initial R^2 -.11 to 21. This is another indication of the greater effect of location and accessibility on this labor force category. Family size is the only socio-economic variable that entered the model. It is suggestive that income did not. If income is not significant, why does density appear in the locational model for women with pre-school children?

The dominance of education and income as factors in married women's participation is striking, .97 and -.91

Table 5.5. Socio-economic Models for Female Labor Force Participation (LFP).

	ADJ R^2	Parameter Estimate	Standard Error	Significance	Standardized coefficent
Model LFP/Women	.62		3.13	0.0001	
Age		-0.57	0.10	0.0001	-.48
Education		0.28	0.08	0.0004	.61
Income		-0.00	0.00	0.0496	-.30
Female Unemploy.		-0.69	0.19	0.0007	-.38
Mobility		0.11	0.05	0.0216	.21
Model LFP/Women With Child 6	.11		5.10	0.0036	
Family Size		-20.68	6.89	0.0036	-.33
Model LFP/Women With Husband Present	.46		3.56	0.0001	
Education		0.46	0.09	0.0001	.97
Family Size		13.45	4.02	0.0013	.35
Income		-0.00	0.00	0.0001	-.91
Total Unemploy.		-1.06	0.36	0.0043	-.45

respectively. Age, education and female unemployment appear to dominate the participation of women with partial coefficinty of -.48, .61, and -.38 respectively.

Table 5.6 shows the results from the combination of each group model for each female labor force category. The locational variables explained 2 percent of the labor force variance of women over that explained by just the socio-economic group (.62-.64). Distance to shopping centers remained statistically significant. The partial regression coefficient is -.23. Distance to CBD lost its significance.

The model for women with children under six has the same R^2 as that for the socio-economic model. Density lost its significance and appears to add no explanation.

The locational variables in the model for married women lost their significance. R^2 actually decreased from the purely socio-economic model from 46 to 42 percent.

CONCLUSION

The female labor force appears to be related to spatial expression more than the male labor force. It is more complex and has more inter-relationships. 80 percent of male labor force participation can be explained by the man's marital status and his educational level. The amount of explained variance in female labor force participation would never get that high regardless of the number of variables

Table 5.6. Combination of Locational/Accessibility and Socio-economic Models for Female Labor Force Participation (LFP).

	ADJ R^2	Parameter Estimate	Standard Error	Significance	Standardized Coefficients
Model LFP/Women	.64		3.09	0.0001	
Age		-0.65	0.11	0.0001	-.58
Education		0.21	0.08	0.0129	.46
Income		-0.00	0.00	0.1625	-.26
Female Unemploy.		-0.85	0.20	0.0001	-.47
Mobility		0.13	0.05	0.0073	.24
Distance-Shop		-1.08	0.50	0.0364	-.23
Distance-CBD		-1.08	0.50	0.0364	-.23
Model LFP/Women W/Child 6	.11		5.08	0.0064	
Family		-17.14	7.36	0.0226	-.27
Density		0.78	0.59	0.1930	.15
Model LFP/Women W/Husband Present	.42		3.58	0.0001	
Education		0.43	0.10	0.0001	.91
Family		9.37	5.45	0.0901	.24
Income		-0.00	0.00	0.0001	-.92
Total Unemploy.		-0.96	0.42	0.0252	-.41
#Employed in C.T.		-0.00	0.00	0.3284	-.10
Distance-Shop		-0.42	0.70	0.5491	-.08
Distance-CBD		0.32	0.41	0.4368	.15

added, due to the inter-relation of the variables. The fact that locational and accessibility variables entered the female models, but not the males, leads to the conclusion that the female labor force is more sensitive to location and inaccessibility.

The most statistically significant indication of this sensitivity is the effect of the distance to shopping centers on total women's labor force participation. It was expected to appear in explanation of married women's participation. An issue here is why did distance to shopping center appear significant in total women's participation model and not in the other two female categories? The relationship must be heavily influenced by single women. But it must be remembered also that married women and women with pre-school children are in this category.

The distance to shopping centers is strongly correlated with centralization; -.52 with density and .62 with distance from the CBD. It is meaningful that these latter variables did not appear significant in the model for women. The results suggest that distance to shopping centers is indeed a distinctly different measure. Therefore, the statement can be made that the probability of a woman working is greater with her proximity in residence to a major shopping center. Whether this relationship exists because these locations facilitate participation in the labor force, or

because working women are choosing these locations, cannot be determined in this study.

Another important issue concerning this relationship is whether it defines a local employment, or a convenient shopping and service condition. In other words, does the relationship exist because of the local jobs, or because of the local convenience to services? Services are plentiful around shopping centers. It was explained in Chapter III that the shopping centers formed clusters on major arterials, producing commercial strip development. Retail sales and the service industry are major employers of women, as the labor force profile indicated. Thus, either jobs or services could explain the relationship. They are even complementary, and probably are both factors.

Accessibility to work does not reinforce this relationship. As accessibility is measured in this study, it is negative with labor force participation. It is concluded that the two measures (mean travel time to work and employment in the census tract) were dominated by the male labor force. Neither of the measures were broken down by sex, unfortunately. What influence of accessibility that actually got measured indicated the severity of the employment mismatch on female participation in the labor force. And the further indication is that the mismatch is most severe on women with children under six.

Women with children under six represent a unique labor force. It is affected by different factors than the rest of the labor force. The results show that family size and density are the two primary variables that are most related to labor force participation of these women. Yet, when the two are combined into one model, density loses significance. Recall that distance to the CBD was significant in the over-all step-wise regression procedure. It is concluded from these results that density or distance to the CBD (in this case indistinquishable) is related to participation of these women only when family sizes are relatively large. The effect must require both low density and larger family size. As family size increases and density decreases, participation decreases. The seemingly complex relationship might suggest income as an underlying factor. But income has a weak insignificant correlation with this participation rate and it did not appear in the models. Income as an explanation must be rejected. It is hypothesized that the home-responsibilities associated with larger families, coupled with lack of services and presence of a pre-school child, combine to constrain the mother from entering the labor force. Fertility trends from Chapter IV indicate a possible alleviation of this problem. But presently it is very real. This segment of the labor force is increasing the fastest.

IMPLICATIONS FOR PLANNING AND FURTHER STUDY

The residence-work separation is very real in Knox County. The majority of the labor force lives in the suburbs and works in the city. Is this an efficient system for households where both husband and wife work? Is the segregation desirable for the environments of either work place or residence? Planners need to take a more pragmatic view of this issue as it affects labor force participation. The majority of a person's daily activity schedule is devoted to work or preparation for work, whether it is house-work or paid labor. Paid labor is now the norm for all.

In consideration of two earner households and female headed households the residence-work separation should be critically examined. Evidence from the literature indicates that the separation is particularly hard on working mothers. It is possible that the advances being made in telecommunications could ease their problems. By use of computer systems, more people (and particularly women with children) could work at home. What are the implications for land use of an increase in home occupations? The work trip would decline in importance. Accessibility to employment would decline as a factor in residential location choices. Other factors would take its place. Good schools and service accessibility would probably increase in importance as a

factor in these decisions. The demands of the new dominant households may bring this change about. It has implications for neighborhood planning and urban revitalization.

Models using accessibility to employment as the primary factor is residential location choices are under question. There are many factors involved in this complex process. This thesis finds no evidence that these decisions are changing due to increasing rates of female labor force participation. Married couples who work are still living in the suburbs, and commuting in to work. Why do married women continue to move to the suburbs where inaccessibility to jobs increases? Are these women satisfied with their residential locations? Surveys would need to be conducted to answer these questions. An implication that could be drawn is that there is a lack of choice. There is no comparable housing in the city to housing in the suburbs. Families desire home ownership. An effort at improving and increasing city housing may meet a demand that already exists. The demand is from two-earner households and female-headed households. Housing market studies need to be conducted primarily for these households. Would they live in the city if good, comparable-to-suburb housing were provided? Cities should conduct such studies because the residence of two-earner households is advantageous to their tax structure. They can pay more taxes. These are exactly the households

that cities need to attract. Good housing is a primary attraction.

One residential pattern that the statistical results in this thesis show is the increase in labor force participation among women in the vicinity of shopping centers. These areas obviously provide the convenience and services that are by desire women who work. The relationship is probably dominated by single women living in rental housing around these areas. This is a reflection on the nature of private development. More dense housing will be found around shopping centers and strip development. These areas should provide the same attractions that the city provides for working mothers or wives. The same argument for housing mentioned above can be applied to these areas.

Working women with children under six present unique needs. Convenient service accessibility and job accessibility are essential. Most importantly is day care. The results of this thesis give evidence that day care is most needed in the city. It is in the city where it is the most critical factor in labor force participation. Planners need to use this in spatial allocation.

This thesis provides limited evidence of an incompatibility between female labor force participation and the urban environment. There is a heightened sensitivity to location and accessibility for women who work. A foundation

is hopefully laid. Potential relationships have been defined. It will take survey research to get at the core of the issue. Residential satisfaction surveys or surveys of employees at a particular employment center could be conducted. Are women satisfied with their work-residence relationship? This remains the question.

The relationship between location and female labor force participation has been explored. Another important avenue for research is the effect of location on occupational segregation and wage discrimination of women.

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