

A Research Note on:

*AN EXPLORATION OF JOURNEY TO WORK AND CHOICE OF HOUSING
LOCATION: 1974 to 1977*

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ABSTRACT

Using Annual Housing survey data, the choice of housing location and mode of transportation to work are compared for the years 1974 and 1977. Chi-square analysis indicates that households are choosing to minimize their transportation costs to work by locating their housing closer to the workplace and using less-expensive modes of transportation than in the past.

INTRODUCTION

The journey to work has long been of interest to planners interested in the movement of people and goods, and household decision-making processes. Movement, commuting behavior and residential location decisions have an impact on urban and rural development (Wingo, 1961 and Kain, 1971). The major purpose of this paper is to explore the journey to work behavior of commuters in the United States from 1974 to 1977. The major hypothesis for the study is that rising energy costs for the journey to work have an effect on the choice of housing location. This paper is focused on changes from 1974 to 1977 in the distance traveled by household heads and the mode of travel used utilizing the Annual Housing Survey. Comparisons are made between SMSA and non-SMSA residents. It was the purpose of this study to explore overall trends that may have occurred in journey to work patterns since 1973.

Previous research studied commuting with respect to general household characteristics (Reeder, 1956; Catanese, 1970); stage in the family life cycle, tenure and mobility (Pickvance, 1973); and occupational or social status (Goldstein and Mayer, 1964; Wheeler, 1967). Much of the literature on journey to work is related to how commuting and location decisions affect or are affected by residential structural development (Kain, 1975).

Some studies have indicated that the distance to workplace had not been a major factor in the decision about housing location in the past (Gallogly, 1974; Goodman, 1974; Morris and Winter, 1978). One hypothesis about separation of home and work is that commuters face

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a tradeoff in their housing-location decisions. The assumption is that a household pays less for housing when it is located away from activity centers, but must, in turn, pay higher commuting costs as they move to the peripheral areas (Schnore, 1954; Kain, 1975; Hirsch, 1977). Another related hypothesis is that a household actively seeks to maximize its housing utility by minimizing the distance separating home and work (Carroll, 1952). Catanese points out that while the least distance can be computed for a particular household, it seldom matches the actual distance traveled by the household head in the journey to work. In addition, Schnore says that the hypothesis of work-trip minimization explains the concentration of residences near workplaces, but does not explain the scatter of residences away from activity centers. However, the hypothesis about work-trip minimization seems to be well accepted and is often cited in commuting literature (Wheeler, 1967).

Clemente and Summers (1974) point out that the ecological arrangement of an area has a strong influence on commuting patterns, for both metropolitan and non-metropolitan regions:

For example, in the rural areas, unlike large cities, there is no spatially continuous housing available. Rather, small towns and villages act as housing nodes (Clemente and Summers, p. 217).

Gladhart (1977) found that while there were no important differences in the residential energy usage of urban versus rural families, the rural families

"used 42% more gasoline for private automobiles than did urban families...and two- and one-half times as much gasoline per month for work as did urban families" (p. 272).

Coates and Weiss (1975) state that, "given the rising cost of gasoline...even mainstream Americans who prefer to live in small towns and rural areas are likely to suffer from constraints on their mobility (access to jobs) in the future because of their lower incomes and virtual necessity of traveling long distances to work" (p. ES-1).

PROCEDURE AND ANALYSIS

The Annual Housing Survey data are collected by interviewing persons living in selected housing units by the United States Bureau of Census. A ten-percent subsample was randomly selected from the years 1974 and 1977 of the Annual Housing Survey National data, resulting in a sample of 9545 units for 1974 and 9631 units for 1977.

Distance to work is the one-way distance in miles traveled by the household head in the journey to work. There is a significant increase in distance to work of commuters between 1974 and 1977 ($\chi^2 = 37.49$, $p < .0001$). A slight decrease in the proportion of commuters who traveled more than 50 miles to the workplace was noted.

The transportation modes referred to in this study are categorized as: a) those who drive alone in private automobiles, b) those who carpool, i.e., drive or ride with another person or persons in a

private automobile, c) those who use public transportation, including railroads, buses, streetcars, subways, elevated trains, or taxicabs, and d) the 'other' category which includes those who walk, ride a bicycle or motorcycle, or any other means of movement not included in the above categories. There is a significant change in the proportions of commuters who used specific transportation modes from 1974 to 1977 (Table 1).

Table 1. Transportation Mode Used for 1974 and 1977

Transportation Mode	1974	1977
	Percent n=4296	Percent n=4204
Drives alone	69.3	71.3
Carpools	14.5	16.4
Public transportation	4.7	4.3
Other	11.5	8.1
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	100.0	100.0

$$\chi^2=30.14, df=3, p<0.0001$$

Further analysis was conducted to learn whether the transportation mode used is related to the journey to work distance for the two years. Chi-square analysis across the categories of the transportation mode used by household heads showed a significant difference existed in the commuting distance for those who drove alone ($\chi^2 = 31.59, p < .0001$) and for those in the 'other' category ($\chi^2 = 21.69, p < .0029$), but no significant difference was found by those carpooling or using public transportation. The most substantial change was the increase in those who traveled less than one mile to the workplace, while all of the rest of the distance categories decreased in proportion.

There is a significant difference in distance traveled by household heads from 1974 to 1977 for residents of Standard Metropolitan Statistical Areas (SMSA's) and non-SMSA's. While the percentages of commuters in each distance category decreased or stayed about the same for non-SMSA residents ($\chi^2 = 30.53, p < .0001$), there were increases in some categories of distance traveled for SMSA residents ($\chi^2 = 15.15, p < .0341$).

There is a significant difference in the mode of transportation used by SMSA/non-SMSA commuters in the journey to work. As expected, the major difference is in the substantially lower percentage of commuters in non-SMSA's who used public transportation. There was also a decrease in the commuters who drove alone for both SMSA and non-SMSA residents with only a slight change noted in the proportions of commuters who carpoled (Table 2).

Table 2. Transportation Mode Used by SMSA/Non-SMSA Residence by year

Transportation Mode	1974 ^a		1977 ^b	
	Percent			
	SMSA	Non-SMSA	SMSA	Non-SMSA
Drive alone	47.5	39.3	41.2	31.7
Carpool	8.7	9.9	8.6	8.4
Public	4.9	0.4	3.7	0.3
Other	5.7	9.4	3.3	5.5
Not applicable	33.2	41.0	43.2	54.1
N	3387	2876	4430	3280

(a) $\chi^2=196.34$, $df=4$, $p<0.0001$

(b) $\chi^2=211.27$, $df=4$, $p<0.0001$

SUMMARY AND IMPLICATIONS

The findings suggest that the distance between home and work may be changing. They also tend to support the hypothesis of worktrip minimization based on adjustments to economic constraints. These changes cannot be assumed to be in response to rising transportation costs of commuting without further analysis, but the findings would seem to be a basis for further exploration into commuting behavior and choice of housing location. This is particularly true in view of the significant findings in transportation mode used and SMSA/non-SMSA differences. The substantial percentage of workers who drive alone confirms the generalization by Starling (1979) that most commuters drive alone in their automobiles to the workplace.

This study included a search for overall differences in commuting behavior for the years 1974 and 1977. The journey to work and decisions about housing location are both very complex. The literature encompasses a diverse and very large body of information. Further study into the implications of rising energy costs and the journey to work should include the following: socioeconomic and housing characteristics of commuters; attitudes about the journey to work and satisfaction with the decision about housing location; and attitudes concerning the energy situation. Data on these areas would be useful in better understanding commuting behavior, why people choose to live where they live, and whether the changing energy picture has, or will eventually, influence these actions.

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