

# Residential Location and Urban Mobility

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Since the end of World War II rapid changes have taken place both in the locational pattern of urban populations and in urban transportation. The objective of the research reported in this paper is to add to our understanding of the forces affecting urban growth and urban transportation by investigating decisions of private households, which, collectively, are probably the most important source of decisions in the city. The research rests on a total of 824 hour-long personal interviews taken in the fall of 1963 with a nationwide probability sample of families living in standard metropolitan statistical areas exclusive of New York. (Because some questions were unanswered or more than one answer to a question occurred, responses in the tabulated matter may deviate from the 824 total.) Interviews were taken in 33 areas.

•THE CHOICES people make concerning their places of residence within metropolitan areas are the topic of the first main section of this report; the second section considers their choices with regard to transportation, taking the location of their residences as given. The analysis of residential location may proceed either by examining the existing distribution over metropolitan areas of families with different characteristics, or by focusing attention directly on people's attitudes and choices. This study relies mainly on the second, more dynamic approach, with a brief analysis of existing locational patterns serving as an introduction to a discussion of forces which appear to be working for changes.

## PRESENT LOCATIONAL DISTRIBUTION

Before discussing the distribution of families among locations within metropolitan areas, it is necessary to decide on what principles locations are to be classified. In this study, several principles of classification are used, with the emphasis on the population density of an area. Density was selected in part because of its known relevance to urban transportation. The success of mass transit systems is related to the population density of the areas they serve. Density also is a useful concept in a study such as this because it can be readily translated into everyday language. People are quite willing to express themselves about living in houses vs living in apartments.

In the measurement of density it is common practice to compute the ratio of population to area for a rather large unit such as a county or a census tract. Investigation has shown, however, that such areas tend to be heterogeneous. Although there are substantial differences from area to area, within areas much variance remains in a variety of characteristics of the population and their residences. For example, Kish (1) showed that suburban places are highly differentiated with respect to many population characteristics. He also showed that if suburbs are grouped into zones by distance, the degree of differentiation is greatest near the center and declines as one proceeds outward. Measures of neighborhood density were therefore developed.

TABLE 1  
DENSITY OF NEIGHBORHOOD BY INCOME AND BY STAGE  
IN FAMILY LIFE CYCLE IN METROPOLITAN AREAS<sup>a</sup>—  
PERCENTAGE DISTRIBUTION

Spending Unit	Neighborhood Density (%)			U. S. Population (%)
	High	Medium	Low	
<b>Income:</b>				
Under 3,000	23	39	38	16
3,000 - 4,999	24	30	46	13
5,000 - 7,499	15	29	56	19
7,500 - 9,999	15	20	65	10
10,000 over	13	14	73	11
All	18	28	54	68
<b>Stage in Family Life Cycle:<sup>b</sup></b>				
Under 45, single	34	35	31	7
Under 45, married, no children	22	48	30	4
Under 45, married, children	11	23	66	24
45 or older, married, children	4	18	78	7
45 or older, married, no children	19	27	54	12
45 or older, single	29	29	42	10
All	18	28	54	68

<sup>a</sup>Data derived from 1962 Survey of Consumer Finances conducted by the Research Center. Family members (primarily adult children living at home) who keep their finances separate from the head and wife were interviewed separately; the latter amounted to only 7 percent of all interviews in the survey. The table includes New York as well as other metropolitan areas.

<sup>b</sup>Based on 1,374 interviews.

be a flow of families from center to suburbs and back over the life cycle. Families may start their independent existence in apartments near the center, but they move to medium- or low-density neighborhoods to raise their children. They may return to high-density areas after the children have grown. Although such a movement takes place, it is by no means a universal pattern. People at all ages and all stages in their lives are found in the low-density areas.

Within the low-density areas, density can be measured in more detail by taking into account size of lot. As Table 2 indicates, there is a strong tendency for valuable homes to be located on large lots. Most homes worth less than \$10,000 are on lots of less than 0.2 acre. Peoples' estimates of home values may be taken as reasonably accurate according to Kish and Lansing (2). Two-thirds of the homes worth \$25,000 or more are on lots of 0.3 acre and larger. This relationship suggests that as people gradually find their incomes rising and, therefore, tend to upgrade their housing, they will consume more space.

A second method of classifying locations used in this study, as in many others, is by distance from city center. Measures of the distance in miles from city center can be made for any given city with reasonable precision by locating addresses on a map. When a number of cities are under consideration, however, the distance in miles to the center is subject to different interpretations depending on the size of the city.

TABLE 2  
SIZE OF LOT FOR SINGLE-FAMILY HOMES

Present Value of House	<0.2 Acre (%)	0.2 to 0.3 Acre (%)	>0.3 Acre (%)	No. of Families
All	47	21	32	553
Under \$10,000	56	18	24	54
\$10,000 - \$14,999	63	15	22	149
\$15,000 - \$24,999	52	23	25	167
\$25,000 and over	11	22	67	84

The method adopted was to include in the neighborhood six structures, three on either side of the sample dwelling. If an apartment house is included, the neighborhood is considered high density. If there is no apartment house but at least one row house or 2 to 4 family houses, the neighborhood is considered one of medium density. Low-density neighborhoods, therefore, are areas of single-family houses.

The probability that an individual family will live in a neighborhood of a given density depends on the family income and on the stage of the family in the family life cycle, as is indicated in Table 1. About three out of four families with annual incomes over \$10,000 live in low-density areas, but only 38 percent of families with incomes below \$3,000 live in such areas.

Young unmarried people and widows and widowers often live in high-density neighborhoods. Married couples in the years when they have young children show a strong tendency to live in low-density areas. Only 4 percent of married couples with the husband aged over 45 who have children under 18 in the family live in high-density neighborhoods. There appears to

The size of sample available makes impossible a detailed examination of the relation between distance from city center and family income or stage in the family life cycle for cities of different size classes. Exploratory tabulations, not here reproduced, tend to indicate, as might be expected, that people in the upper income groups in general live farther out than those in the lower income groups.

## Consumer Aspirations and Potential Changes in Location

The problem of drawing inferences from present locations about future locational trends is a difficult one. In the first place, present locations often reflect decisions made many years ago rather than current preferences. Future locational patterns will be determined in part by the decisions of newly formed families and, much more importantly, by the choices of the many existing families which may decide to move. The previous section showed that income and demographic factors influence residential location. Much of the variation in residential location between families remains unexplained, however, when only such variables are taken into account because individual tastes also play an important role. Tastes not only differ between families within the same socio-economic group but also may change over time. Ideas as to what constitutes an appropriate and desirable place to live have been transformed in the past by the growing affluence of our society and may continue to undergo change. Hence, past changes in residential location cannot be mechanically projected into the future.

One of the most dynamic factors in the housing market throughout the past 15 years was the shift of population to the suburbs and the consequent growth of shopping centers and outlying community facilities. To many blue collar families suburban living was a new experience and represented a major upward step in their standard of living. Some experts believe that the outward movement from the cities may be reaching a limit now for two reasons: (a) the scarcity of land in reasonably convenient suburban locations, and (b) the time and cost involved in commuting longer distances to work. Both arguments should carry some weight, but without an analysis of consumer preferences they are insufficient.

Some ideas about the kinds of location and housing people would like to have in the future can be obtained from detailed interviews with a representative group of consumers. By discussing with people their plans for future moves, their satisfactions and dissatisfactions with their present place of residence, and the reasons for these attitudes, as well as their wishes and desires, incipient trends in the housing market can be discerned, although they cannot be precisely forecast. Asking people what they need and want differs considerably from a forecasting approach which assumes that the rational consumer is intent on minimizing his commuting time and costs, maximizing the amount of space he obtains per dollar of housing outlay, and the like. However, consumer surveys focus on the demand side of the market. Changes in buying patterns which originate on the supply side, for instance in a major improvement of the product, often may not be anticipated by consumers. The recent boom in apartment demand, for example, was not foreshadowed by a shift in consumer preferences.

**The Moving Decision.**—The frequency with which urban families move from one house to another is in large part responsible for the fluidity of residential location patterns. The importance of the moving decision is apparent in Table 3, which indicates that over one-half of metropolitan area families think they will or may move during the next 5 years. That these plans are not unrealistic is indicated by the finding that among the group of metropolitan area families studied, 52 percent moved during the past 5 years. The potentially mobile group is about as large now in relation to the total population (according to Survey Research Center measurements) as it has been throughout the past 10 years. Moving plans are particularly frequent among young families and among those renting their present house or apartment. Because of the concentration of renters in higher-density areas, moving plans are much more com-

TABLE 3  
PLANS TO MOVE DURING THE NEXT 5 YEARS<sup>a</sup>

Family Characteristic	Distribution of Respondents (%)		No. of Cases
	Plans to Move in Next 5 Yr	No Plans to Move	
All	54	46	824
Age:			
Under 35	77	23	221
35 - 64	50	50	463
65 and over	28	72	129
Owns or pays rent:			
Pays rent	82	18	282
Owns or is buying	40	60	524

<sup>a</sup>The questions were: "Do you think there is any chance you will move in the next twelve months?" "Do you think there is any chance you will move to a new home in the next five years?"

TABLE 4  
PRIMARY FACTORS IN THE MOVING DECISION

Factors	Moved in the Past 5 Yr (%) <sup>a</sup>	Plan to Move in the Next 5 Yr (%) <sup>b</sup>
Housing itself	32	31
Cost considerations	14	13
Nearness to place of work (including occupation changes)	13	23
Other locational considerations	18	3
Neighborhood considerations	22	9
Other	14	15
Not ascertained	— <sup>c</sup>	— <sup>c</sup>
Total	— <sup>d</sup>	100

<sup>a</sup>The questions were: "All things considered, how do you feel now about the move—was it a good idea or a poor idea to move here?"

<sup>b</sup>"Why do you feel that way?" Figures based on answers given by 429 people.

<sup>c</sup>The question was: "If definitely will move in the next 5 yr, probably will, or may, what might make you move?" Figures based on answers given by 447 people.

<sup>d</sup>Less than 0.5 percent.

<sup>e</sup>More than 100 percent; two mentions were allowed and the results summed.

what kind of a place they were looking for when they first started out to find a house, they mentioned locational preferences more frequently than any other feature of the house (3). The same picture emerges from the responses of people who said they would or might move during the next 5 yr. This group was asked why they were thinking of moving. Again locational and neighborhood reasons (including job changes) were mentioned with about the same frequency as house and cost-related reasons. Major decisions are often motivated by more than one consideration. In the case of housing, the desire for more space, for example, may lead to a moving decision more readily if a wish to live in a different kind of neighborhood is also present. It may be more fruitful, therefore, to visualize housing reasons and locational reasons for moving as mutually reinforcing, rather than to speculate which one, by itself, is the more important motivating force.

That the majority of moves occurring in metropolitan areas are upgrading moves is indicated by the considerable preponderance of recent movers who said they spent more on housing after the move (62 percent) over those who reported that they spent less (19 percent). On the other hand, upgrading need not imply more space. The overall increase in the number of rooms occupied by recent movers before and after the move is small.

Locational Preferences.—Frequent moves on the part of metropolitan area families may lead to a large-scale shift of population out of (or into) the center of the city, or they may imply that families merely "play musical chairs." This problem was approached by first asking people, "If you could do as you please, would you like to live closer to the center of (. . . metro area. . .) or farther from the center or just where you are?" Table 5 indicates that about 70 percent of people express satisfaction with their present location; among the remaining 30 percent the answer "farther out" is three times as frequent as the answer "we would like to live closer in." Similar results were obtained in earlier Survey Research Center surveys in 1961 and 1963. Thus, the finding that many people prefer to move farther out is confirmed by repeated measurements.

The contrary wish, to live closer to the downtown area, is most frequent among older people, families with incomes under \$3,000, and people who do not engage in outdoor activities (a characteristic associated with advancing age and low income). The desire to live farther out is particularly pronounced among married couples with children; one-fourth of this group would like to live farther out. Significantly, the desire to live farther out does not diminish at all with the distance which people already live from the center of the metropolitan city. The desire to move farther out is not closely related to the population of the metropolitan area in which people now live. Of every size class studied, more people want to move farther out than want to move closer to the center of cities.

mon among people in areas of medium or high density than among residents of low-density areas. Moving plans vary little by income, but increase in frequency with education.

The crucial role of the house (or apartment) when it comes to the moving decision is apparent in Table 4 which indicates that, when evaluating the success of their most recent move, about half of all movers evaluated it in terms of the housing they obtained and the money they had to spend for the purpose. Yet suitable housing at the right price often is available at a number of alternative locations. Hence, many other people judged their most recent move by referring to neighborhood and location factors. In a 1950 study, when recent home buyers were asked

TABLE 5  
 LOCATIONAL PREFERENCE OF RESIDENTS OF METROPOLITAN AREAS

Characteristic	Would Prefer to Live <sup>a</sup>				No. of Cases
	Closer to Center of Metro Area (%)	Same Distance (%)	Farther Out (%)	N. A.	
All	7	71	21	1	824
Income:					
Less than \$3,000	10	72	18	— <sup>b</sup>	131
\$3,000 - 7,499	6	72	22	— <sup>b</sup>	336
\$7,500 and over	7	72	21	— <sup>b</sup>	340
Age of family head:					
Under 35	9	62	29	— <sup>b</sup>	221
35 - 64	5	75	20	— <sup>b</sup>	463
65 and over	11	75	12	2	129
Life cycle:					
Single	9	76	13	2	175
Married without children	6	74	20	— <sup>b</sup>	236
Married with children	7	67	26	— <sup>b</sup>	382
Present distance (mi):					
0 - 3.9	5	72	22	1	254
4.0 - 7.9	5	73	22	— <sup>b</sup>	246
8.0 - 14.9	11	71	18	— <sup>b</sup>	189
15.0 and over	10	70	20	— <sup>b</sup>	135
City size:					
Population of 1,500,000 or more	10	65	25	— <sup>b</sup>	334
Population 350,000 - 1,499,999	6	74	20	— <sup>b</sup>	250
Population 350,000 or less	4	78	17	1	240
Attitude to neighborhood:					
Like very much	5	81	14	— <sup>b</sup>	472
Like moderately well	10	60	29	1	310
Dislike	18	42	40	— <sup>b</sup>	40

<sup>a</sup>The question: "If you could do as you please, would you like to live closer to the center of (...metro area...), or farther from the center, or just where you are?"

<sup>b</sup>Less than half of 1 percent.

Of particular interest is the proportion of the mobile population who would like to move farther out. Among those families who said they would move or might move within the metropolitan area during the next 5 years, about 40 percent reported that they planned to move farther out. This high proportion corresponds to recent experience. Among the group who moved within the metropolitan area during the past 5 years, as many as 42 percent reported that they moved farther out.

The desire to live farther out was usually explained in terms of physical characteristics such as getting away from noise, traffic, dirt, and crowding. As might be imagined, status considerations were hardly ever mentioned explicitly as a reason for wanting to live somewhere else. However, the lowest part of Table 5 indicates that the desire to move farther out or closer in is frequently associated with some dislike

TABLE 6  
PREFERENCE FOR SUBURBAN VS COUNTRY LIVING<sup>a</sup>

Characteristic	Prefer			No. of Cases
	House in Suburbs (%)	House in Country (%)	Neither (%)	
All	52	45	3	824
Income:				
Under \$3,000	70	26	4	131
\$3,000 - 7,499	48	48	4	336
\$7,500 and over	49	49	2	340
Age of family head:				
Under 35	42	57	1	221
35 - 64	53	45	2	463
65 and over	65	27	8	129
Family life cycle:				
Single	63	32	5	175
Married without children	47	49	4	236
Married with children	49	50	1	382
Distance from center of city:				
0 - 1.9 mi	54	39	7	119
2.0 - 3.9 mi	55	42	3	135
4.0 - 7.9 mi	52	46	2	246
8.0 - 14.9 mi	53	44	3	189
15.0 mi and over	43	56	1	135
Number of outdoor activities:				
None	51	43	6	51
1 - 3	55	42	3	499
4 - 5	48	49	3	210
6 or more	35	63	2	62

<sup>a</sup>The question was: "Suppose you had to choose between a house in the suburbs on a paved street with sidewalks and lawns, or a house in the country with woods, or a field between you and the next house—which would you choose?" Figures are based on answers given by residents of metropolitan areas.

of one's present neighborhood. The major reason for wanting to live closer to downtown or for expressing satisfaction with one's present location is closeness to stores, schools, and sometimes work.

To determine how strong the attraction of the out-of-doors and of a more rustic life is to residents of metropolitan areas, a more extreme question was put to respondents: "Suppose you had to choose between a house in the suburbs on a paved street with a sidewalk and lawns or a house in the country with woods or a field between you and the next house, which would you choose?" Fully 45 percent of metropolitan area residents expressed a preference for the house in the country. As Table 6 indicates, the proportion of people who prefer living in the country is below 40 percent only for the group with income below \$3,000, those over 65 years old, and single people. By contrast, 57 percent of people under 35 and 50 percent of couples with children prefer to live in the country. This is indeed a remarkable finding considering that the question specified a very rural setting for the house in the country, "with woods or a field between you and the next house." Needless to say, these answers reflect wishes or aspirations, rather than concrete plans to be realized in the near future. Yet they seem to be indicative of a widespread liking for outdoor and informal living, and more importantly, of a continued movement toward less urbanized locations among our highly mobile metropolitan population.

The desire for space and pleasing nonurban surroundings also is evident in homeowners' attitudes toward the size of their lot. Generally, the majority of homeowners are satisfied with the size of their lot. Yet among the very large group with lots of less than 0.2 acre, 35 percent would like to have a larger lot; and in the group with 0.2 to 0.3 acre, a larger lot is desired by 20 percent. "We want space for outdoor activities" and "we want more privacy" are the most common explanations given by people who find their lot too small. Only among those with 0.3 acre or more is the group saying "too large" more numerous than the group saying "too small." The feeling that the lot is too large is almost always associated with complaints about maintenance work. The answer that the lot is too small is somewhat more frequent among homeowners with older and cheaper houses than among others, but does not vary systematically by distance from the center of the city.

**Attitudes Toward the Neighborhood.**—What makes people like or dislike their neighborhoods? This question can be examined in two ways: (a) by asking people directly or indirectly to express their likes and dislikes about the neighborhood in which they live; or (b) by studying the factors associated with favorable and unfavorable attitudes toward the neighborhood.

With the first approach, people were asked, "What are the things you like about this neighborhood?" and "What are the things you dislike about this neighborhood?" Finally, an indirect question was asked in the belief that sensitive matters such as status considerations and attitudes toward minority groups could be elicited more readily by an impersonal approach: "Let's imagine that Mr. and Mrs. Smith were looking for a new home. They found a place they liked but they decided not to take it because they didn't like the neighborhood. What do you think they didn't like about the neighborhood?" The answers to this series of questions show that three considerations play an important role in the evaluation of neighborhoods: the kinds of people who live there; physical characteristics such as cleanliness, noise, traffic, and crowding; and convenience of location, particularly closeness to stores, schools, and work. Nice neighbors were mentioned with considerable frequency as a favorable factor in the present neighborhood. As expected, references to undesirable people appeared primarily in response to the Mr. and Mrs. Smith question.

After the various expressed attitudes toward the neighborhood had been recorded, the discussion was summed up by asking, "All in all, would you say you like this neighborhood very much, like it moderately well, or dislike it?" In reply, 57 percent of people expressed unqualified liking for their neighborhood, 38 percent said they liked it only moderately well, and 5 percent stated flatly that they disliked it. Most commonly in response to survey questions,

a majority of people express satisfaction with their standard of living, their possessions, and even their occupational progress. In this perspective, the group who said they like their neighborhood does not appear impressively large. Table 7 compares likes and dislikes about the neighborhood for people who expressed unqualified approval of their present neighborhood and those who liked it only moderately well or disliked it. It appears that feelings about the kind of people living in a neighborhood and the physical characteristics of the neighborhood are more influential in determining overall attitudes toward the neighborhood than is convenience of location.

A comparison of the socio-economic and locational characteristics of people with different attitudes toward their neighborhood shows that people who like their

TABLE 7

Comments	Attitude Toward Neighborhood <sup>a</sup>		
	Like Very Much (%) <sup>b</sup>	Like Moderately Well (%) <sup>c</sup>	Dislike (%) <sup>d</sup>
<b>Favorable:</b>			
Kinds of people living there	68	46	8
Physical characteristics (quiet, clean, no traffic, etc.)	61	41	5
Convenience of location	55	61	28
<b>Unfavorable:</b>			
Kinds of people living there	13	30	78
Physical characteristics (noise, dirt, traffic, etc.)	27	44	63
Inconvenience of location	13	16	30

<sup>a</sup>The questions were: "All in all, would you say you like this neighborhood very much, like it moderately well, or dislike it?" "What are the things that you like about this neighborhood?" "What are the things, if any, which you dislike about this neighborhood?" Figures based on answers given by residents of metropolitan areas.

<sup>b</sup>Based on 472 cases.

<sup>c</sup>Based on 310 cases.

<sup>d</sup>Based on 40 cases.

TABLE 8  
FREQUENCY OF VISITING DOWNTOWN (FOR PURPOSES OTHER THAN WORK) BY ACTUAL DISTANCE FROM CENTER OF CITY<sup>a</sup>

Characteristic	Frequency Distribution of Visits Downtown <sup>(b)</sup>				No. of Cases
	Never	Less Often than Once a Month	Once a Month - Several Times a Month	Once a Week or More Often	
All	17	35	29	19	705
Distance from Center					
0 - 1.9 miles	-c	-c	-c	-c	119
2.0 - 3.9 miles	9	30	31	30	135
4.0 - 7.9 miles	12	35	36	18	246
8.0 - 14.9 miles	22	37	25	16	189
15.0 miles and over	27	40	20	13	135
City Population					
1,500,000 or more	29	34	24	13	334
350,000 - 1,499,999	7	44	30	19	250
350,000 or less	12	20	31	37	240

<sup>a</sup>Purposes of visits were as follows: shopping, 75 percent; spectator events, 20 percent; cut out, 5 percent; use medical or dental facilities, 13 percent; visit friends and relatives, 9 percent; personal business (pay bills), 23 percent; sightseeing, 5 percent; other, 6 percent; and not ascertained, 11 percent. Total does not add to 100 percent because respondents were allowed more than one mention. These figures were based on 683 cases.  
<sup>b</sup>The questions were: "How often do you or your family visit downtown (...metro area...) other than for work?" "For what purposes do you people go downtown?"  
<sup>c</sup>These figures for the frequency of visiting downtown were omitted since this group lives virtually in the downtown area.

neighborhood only moderately well or dislike it have a tendency to live in older houses (and therefore in older neighborhoods), in areas of high and medium density, and very close (0 to 1.9 mi) to the center of the metropolitan area; that is, they reside in the older, more urbanized and congested locations. Young people also tend to be critical of their neighborhood, visualizing perhaps a better neighborhood to which they expect to move when they attain their full earning capacity. On the other hand, low and high income people do not differ significantly in satisfaction with their neighborhood.

It appears, therefore, that attitudes toward one's neighborhood depend largely on physical characteristics and on the kinds of people living in the neighborhood.

The emphasis on people in some cases means concern about the proximity of minority groups, but often it seems to reflect social status considerations generally, which no doubt have an important bearing on locational preferences. One might go further and ask whether unfavorable comments about physical characteristics of the neighborhood such as noise, crowds, dirt, and traffic are merely an indirect way of expressing an aversion to the kinds of people living in the high-density neighborhoods. The widespread desire for rural surroundings (evident in Table 6), the popularity of outdoor recreation, and some dissatisfaction with small lots argue against this interpretation. Rather, it appears that people, and particularly young people with children, attach a positive value to closeness to the out-of-doors, open spaces, informal living, in addition to status considerations. Conversely, they dislike crowding, noise, and traffic as such. This distinction between status reasons for moving farther out and the desire for less urbanized surroundings is important for city planning. The findings of this study underline the importance of parks, recreation areas, open spaces, and careful segregation of land uses, if a physical environment pleasing to the resident is to be maintained or created closer to urban centers.

**Convenience of Location.**—Concern about "nice" people, social status, and physical characteristics of the neighborhood undoubtedly are forces which pull the population toward outlying locations. On the other hand, considerations of convenience should exert a pull in the opposite direction, toward the center of the metropolitan area. Indeed location theorists as well as builders emphasize that the feasible outward movement of population is limited by the time and costs involved in commuting long distances.

TABLE 9  
DISTANCE TO WORK BY ACTUAL DISTANCE FROM CENTER OF CITY

Distance to Work	Distances of Home from Center of City (%) <sup>a</sup>						All (%)	No. of Cases
	0 - 1.9 Mi	2.0 - 3.9 Mi	4.0 - 5.9 Mi	6.0 - 9.9 Mi	10.0 - 14.9 Mi	15.0 Mi and Over		
0 - 1.9 mi	6	2	3	3	3	2	19	117
2.0 - 3.9 mi	4	3	4	2	3	3	19	112
4.0 - 5.9 mi	1	3	4	3	2	3	16	93
6.0 - 9.9 mi	— <sup>b</sup>	5	3	5	3	2	20	117
10.0 - 14.9 mi	— <sup>b</sup>	2	3	2	4	2	13	76
15.0 mi and over	1	1	2	2	3	4	13	77
Total	14 <sup>c</sup>	16 <sup>d</sup>	19 <sup>e</sup>	17 <sup>f</sup>	18 <sup>g</sup>	16 <sup>h</sup>	100	592

<sup>a</sup>The question was: "How far is it from your home to (worker's) place of work?"  
<sup>b</sup>Less than one-half of 1 percent. <sup>c</sup>Based on 83 cases. <sup>d</sup>Based on 97 cases.  
<sup>e</sup>Based on 110 cases. <sup>f</sup>Based on 102 cases. <sup>g</sup>Based on 105 cases.  
<sup>h</sup>Based on 95 cases.



An examination of the survey data suggests that the inward pull exerted by considerations of convenience may be weaker than is often supposed. We know that new schools are built to serve outlying areas, so that the wish to be close to schools will hardly deter people from moving farther out. The development of suburban shopping centers enables the suburban consumer to shop close to home. Table 8 indicates that half of all residents of metropolitan areas go downtown less often than once a month, other than for work. The frequency of downtown visits decreases with the distance people live from the center of the city. It also is lower for the very large metropolitan centers than for the smaller ones.

It remains, therefore, to ask how often the burden of a long journey to work will outweigh reasons for moving farther out. To gain some measure of the importance attached to closeness to work, people who moved during the past 5 years and are in the labor force were asked, "When you were looking for a new home, how important to you was it to live close to the place where you (or your husband) works?" Over 40 percent of recent movers answered flatly that this consideration was of no importance at all and another fourth of the movers said that it was only somewhat important. Married couples with children in particular tend to attach relatively little importance to the journey to work, perhaps because the advantages of suburban living for a family with children are foremost in their minds. The distribution of attitudes toward closeness to work by present distance and time to work shows that those to whom closeness to work was important did indeed settle closer to their place of work than other movers. Conversely, those to whom closeness to work made no difference now tend to live in outlying locations.

Yet it does not follow that people in outlying locations always or even predominately have longer journeys to work than those who live close to the downtown area. The decentralization of factories, shopping centers, branch banks, doctors' offices and other service establishments, and even occasionally the administrative offices of large corporations, means that the journey to work need not be a journey downtown and often is shorter than the journey downtown. Table 9 indicates a rather weak relationship between distance to work and distance to the center of the metropolitan area. A similar picture emerges from the experience of recent movers. The survey shows that 41 percent of recent movers located farther out, but only 25 percent had a longer trip to work after the move. In fact, although nearly twice as many families moved farther out as moved closer to the center, at least as many people reported that the time it takes to get to work was shortened by the most recent move as reported that it was lengthened. The time to get to work and the distance to work are by no means identical, as indicated in Table 10. It is possible to move to a location no closer to the place of work but more quickly accessible to it.

The conflicting forces influencing residential location require further study. On the basis of the present data, the centrifugal forces represented by status considerations and the widely prevailing preference for uncongested areas, space, quiet, and closeness to the out-of-doors appear powerful. They appear more powerful than the centripetal forces represented by the attraction of the downtown area for shopping, personal business and leisure time activities or the advantage of a shorter trip to work. If this interpretation of the data is correct, it follows that moving farther out will remain a major aspect of upgrading in the housing market.

TABLE 10  
TIME TAKEN TO GET TO WORK BY DISTANCE TO WORK

Distance	Time Distribution (%)						N. A. <sup>a</sup>	No. of Cases
	<10 Min	10 - 14 Min	15 - 19 Min	20 - 29 Min	30 - 44 Min	45 Min and Over		
0 - 1.9 mi	64	23	9	1	1	— <sup>b</sup>	2	80
2.0 - 5.9 mi	12	37	37	11	1	1	1	189
6.0 - 9.9 mi	1	13	22	50	13	— <sup>b</sup>	1	108
10.0 - 14.9 mi	1	— <sup>b</sup>	16	38	37	7	1	71
15.0 mi and over	— <sup>b</sup>	— <sup>b</sup>	5	21	37	37	— <sup>b</sup>	71

<sup>a</sup>Not ascertained.

<sup>b</sup>Less than half of 1 percent.

What kind of housing do people want? Associated with the desire to live farther out is a continuing preference for single- over multiple-family housing. Indeed, the study of Residential Location and Urban Mobility as well as other recent Survey Research Center data suggest that a further shift toward single-family housing may be in prospect. The recent upturn in the demand for apartments does not contradict this finding. In part, this increase in demand is occasioned by a more varied and attractive supply. Perhaps even more crucial are two other factors: (a) a change in the age distribution of the population resulting in an increase in the proportion of older people at the expense of the middle-age brackets, and (b) an improvement in the incomes of single-person families (especially widows) as a result of social security and pension funds, which enable them to maintain separate households (4).

About two-thirds of the population in metropolitan areas now live in single-family houses, but 83 percent would prefer to be in a one-family house. The group who would like to shift from a multiple-family unit to a single-family house comprises 20 percent of families residing in metropolitan areas, whereas the group wanting to make the opposite kind of move includes only 3 percent of families. Among the 20 percent of families who want to change to single-family housing, only about one-fifth have very low incomes which might stand in the way of their becoming homeowners. Most of them are in the middle and upper income brackets, are married, and in the lower and middle-age brackets so that home ownership appears to be a realistic aspiration. Undoubtedly, many of them are living in apartments temporarily during the early years of marriage or as a result of having moved into the metropolitan area recently from another city or town.

Table 11 compares the present housing status of potential movers with (a) their preferred housing status and (b) the kind of housing they plan to move into. Again, a shift toward single-family houses is indicated.

The large majority of those who said they prefer single-family houses spoke of privacy or of getting away from the noise and closeness of apartment house living. The major attraction of apartments in the eyes of consumers is that they are more convenient, easier to maintain, and cheaper. The advantage of being close to people was mentioned by one in six of those preferring apartments.

Although in the metropolitan population as a whole only 16 percent of people prefer living in an apartment, this proportion is considerably higher among certain subgroups: 24 percent of people under 25 years of age and 30 percent of those over 65 prefer apartments. Similarly, 40 percent of single people and 36 percent of those with incomes under \$3,000 would choose an apartment, "if they could do as they please." Although these proportions are sizable, even among these groups the majority would like to live in a single-family house.

The widely prevailing preference for single-family housing is, of course, partly responsible for the movement to the suburbs. Among those who want to move farther out only about 7 percent said they would like to live in an apartment. The smaller group who want to live closer to the center showed somewhat more liking for apartments: they preferred them in 26 percent of cases. Yet in over 70 percent of cases even those who want to live closer to the center would like to live in a single-family house. This finding points up one of the difficulties of achieving a return movement of population to the central areas of our large cities.

Desire for Vacation Home. — The liking for the out-of-doors also manifests itself in aspirations to own a vacation home. At present somewhat over 5 percent of all metropolitan area families have a vacation home or cottage; this proportion is

TABLE 11  
PRESENT, PREFERRED, AND PLANNED TYPE  
OF HOUSING<sup>a</sup>

Type	Presently Occupied (%) <sup>b</sup>	Preferred (%) <sup>b</sup>	Planned (%) <sup>b</sup>
Single-family house	54	84	68
Multiple-family dwellings	43	14	24
Other	3	1	3
N. A.	— <sup>c</sup>	1	5

<sup>a</sup>Includes those who plan to move within the metropolitan area during the next 5 yr. The questions were: "If you could do as you please, would you live in a single family house, or an apartment house, or what?" "Would you be more likely to move to a single family house, an apartment, or what?"

<sup>b</sup>Based on 331 cases.

<sup>c</sup>Less than one-half of 1 percent.

TABLE 12  
PRESENT OWNERSHIP OF AND DESIRE FOR VACATION HOME<sup>a</sup>

Income	Owns 2 Homes (%)	Has Considered — Good or Fair Chance of Achievement (%)	Has Considered — 50 - 50 Chance of Achievement (%)	Not Likely (%)	No. of Cases
All	8	10	4	78	824
Less than \$3,000	5	6	1	88	131
\$3,000 - \$7,499	7	6	4	83	336
\$7,500 and over	11	16	5	68	340

<sup>a</sup>Figures in table overstate proportion of people owning or hoping to own two homes, since some people understood question to include rental property. Thirty-four percent of those already owning 2 homes rent one of them all or part of the year. Eleven percent of those hoping to own 2 homes want the second for rental property. The questions were: "Do you own two homes, such as a house and an apartment, a winter home and a vacation home or something like that?" "Have you ever thought you might like two homes?" "What do you think the chances are that you actually will set up an arrangement like that?"

higher among upper income families. In reply to the question "Have you ever thought that you might like two homes?" more than half of all families replied that they would like a vacation home. Most of the families who expressed a desire for a vacation home did not believe that they would be able to realize this wish; about 10 percent of metropolitan families thought there was a good or fair chance that they would be able to buy a vacation cottage or house in the future (Table 12). The growth of two-car ownership was foreshadowed by similar expressions of wishes and aspirations by consumers. If incomes continue to rise, purchases of vacation cottages may well become a significant discretionary expenditure by consumers in the upper and upper-middle income brackets. They may also create new weekend commuting problems.

#### URBAN MOBILITY

One way of looking at the problems of urban mobility is to think of a three-stage sequence of decisions. People make decisions, first, concerning the location of their residences; second, concerning number of automobiles to own; and third, concerning number of trips to take and whether to make these trips by automobile or by common carrier. This report is organized in that sequence, i. e., following a typical sequence of the thinking of individual families rather than the logical sequences in the minds of those concerned with urban planning, who are well aware that people will not move to areas which are inaccessible.

#### Automobile Ownership

Table 13 gives the determinants of automobile ownership. How many miles a year the family drives its car is also indicated as a measure of the volume of transportation a family uses. In a sense, the number of miles per year may be regarded as an alternative dependent variable to the number of trips per day.

Density of neighborhood is associated with automobile ownership. Of those who live in high-density neighborhoods, only one-half own a car; of those who live in medium-density neighborhoods, two-thirds own a car; but of those who live in the low-density neighborhoods, 90 percent own a car. Even this finding considered in isolation shows that there is a connection between where people live and their use of transportation.

Previous work has shown differences in automobile ownership within the group of the largest metropolitan areas when these areas are classified into old cities and new

TABLE 13

## DETERMINANTS OF AUTOMOBILE OWNERSHIP AND OF MEAN NUMBER OF MILES PER YEAR THE PRINCIPAL FAMILY CAR IS DRIVEN

Family Characteristic <sup>a</sup>	Car Owners (%)	Mean No. of Mi/Yr on First Car <sup>b</sup>	No. of Families Owning Cars	Total No. of Families
All	81	10,900	583	718
Density of neighborhood				
Very low	95	10,800	22	23
Low	90	11,000	391	434
Medium	66	10,400	61	92
High	52	11,300	56	93
Age and size of city <sup>c</sup>				
Central city of one of the 11 largest cities				
Old city	47	8,900	28	59
New city	71	10,500	39	55
Not the central city of one of the 11 largest cities	85	11,100	516	604
Income				
Less than \$2,000	27	8,200	18	67
\$ 2,000 - 2,999	46	6,000	23	50
\$ 3,000 - 3,999	53	8,200	25	47
\$ 4,000 - 4,999	84	8,800	43	51
\$ 5,000 - 5,999	91	10,000	74	81
\$ 6,000 - 7,499	90	10,500	97	108
\$ 7,500 - 9,999	96	12,300	117	122
\$10,000 - 14,999	96	12,200	111	115
\$15,000 and over	100	12,500	66	66
Number of adults in family				
1	48	9,400	74	155
2	91	11,000	422	463
3	86	11,700	67	78
4 or more	91	12,400	20	22

<sup>a</sup>All parts of this table exclude families where a certain characteristic was not ascertained.

<sup>b</sup>Includes mileage for only one car if the family owns several.

<sup>c</sup>Old cities are those where the central city had a population over 500,000 as of 1900, including Baltimore, Boston, Chicago, St. Louis, and Philadelphia. New cities are those where the central city had a population under 500,000 as of 1900. They include Cleveland, Detroit, Los Angeles, Pittsburgh, San Francisco, and Washington, D. C. New York is excluded.

cities. Old cities are taken here as those in which the central city had a population of over 500,000 in 1900, and new cities as those in which that population was reached more recently. Roughly, the distinction is between cities which became large before and after the impact of the automobile on urban areas began to be felt. (In this connection see also the following analysis of Census data concerning the journey to work.) Among the eleven largest cities differences in automobile ownership do appear between the old and new cities, with 47 percent of families in old cities and 71 percent in new

TABLE 14  
MEAN NUMBER OF EQUIVALENT VEHICLE-TRIPS IN  
THE LAST 24 HOURS<sup>a</sup>

Family Characteristic	Mean No. of Equivalent Veh-Trips <sup>b</sup>	No. of Families
All	5.2	822
Auto ownership		
No car	1.7	135
Own 1 car	4.5	384
Own 2	7.2	250
Own 3 or more	9.2	53
Density of neighborhood		
Very low	7.2	30
Low	5.7	495
Medium	4.3	112
High	3.4	101
Frontage of lot (ft)		
<30	3.0	7
30 - 39	5.0	30
40 - 49	5.0	33
50 - 59	5.6	101
60 - 69	5.9	101
70 - 79	5.6	44
80 - 89	5.0	37
90 - 99	6.6	15
100 - 124	6.3	85
125 - 149	7.3	16
150 and over	7.2	36
Size and age of city		
Central city of one of 11 largest cities		
Old cities	2.7	65
New cities	5.0	62
Not central city of one of 11 largest cities	5.4	695
Family income		
<\$2,000	1.6	74
\$ 2,000 - 2,999	2.8	56
\$ 3,000 - 3,999	3.3	50
\$ 4,000 - 4,999	4.2	59
\$ 5,000 - 5,999	4.6	98
\$ 6,000 - 7,499	5.5	129
\$ 7,500 - 9,999	5.6	143
\$10,000 - 14,999	7.4	125
\$15,000 and over	8.3	72
Age of head		
18 - 24	4.7	73
25 - 34	5.4	148
35 - 44	5.9	213
45 - 54	6.9	142
55 - 64	4.9	107
65 - 74	2.6	88
75 and over	2.1	40
Number of adults		
1	2.5	161
2	5.4	543
3	7.0	94
4 or more	9.7	24

<sup>a</sup>Means based on trip report for the family.

<sup>b</sup>For travel by auto, vehicle-trips have the usual meaning. For travel by common carrier, if two or more members of family travel together on same trip, it is considered one equivalent vehicle-trip.

The dependent variable selected for analysis is a variation on the familiar concept of vehicle-trips. A family's travel by auto is measured by counting vehicle-trips. When some members take a trip by common carrier, however, the vehicle-trip is not a sensible unit to consider. The problem was handled by considering as one equivalent vehicle-trip an excursion by common carrier which included one, two, or more members of the family interviewed. Walking to work is counted as taking a trip, following the conventional usage in urban transportation studies, but no other walking trips are counted. Some other investigators have worked with the count of trips as a dependent variable; we have used vehicle-trips in this simple analysis as closer to what transportation planners need to know.

new cities owning automobiles. The level of automobile ownership is highest in the smaller metropolitan areas, where it reaches 85 percent. There also appear to be differences in the number of miles per year cars are driven, which accentuate the differences in ownership.

The effect of income on automobile ownership is confined to people at the lower end of the income distribution. Of families with incomes of \$5,000 a year and above, 90 percent or more own a car in the metropolitan areas studied. There are differences in automobile ownership among income groups below that level, however. Only about one family in four owns a car in the income group below \$2,000.

The mean number of miles per year which the first car is driven does increase with the income of the family. It is approximately 8,000 mi a year up to the middle of the income distribution, but rises to 12,000 mi for those with incomes in the range beyond about 12,000 mi; presumably, people in the higher income groups drive more miles but buy second and third cars.

Families with two or more adults are about twice as likely to own a car as families with only one adult. This relationship supports the findings reported earlier than single adults tend to live in high-density areas and that those who live in such areas less often own cars.

### Trip Generation

Trip generation rates are of basic importance in studies of urban transportation. Although much is known about these rates, additional knowledge about them can be useful. A limited set of calculations of trip generation rates is presented here with the objective of permitting comparison with other bodies of data and of providing an increment of new information.

TABLE 15  
CHARACTERISTICS OF THE JOURNEY TO WORK  
BY CAR

Characteristics <sup>a</sup>	Journeys to Work (%)
Distribution of cars by number of occupants <sup>b</sup>	
One	90
Two	8
Three	1
Four	1
Five	— <sup>c</sup>
Length of time to get to work (min) <sup>d</sup>	
1 - 4	3
5 - 9	11
10 - 14	20
15 - 19	23
20 - 29	24
30 - 44	13
45 - 59	4
60 or more	2
Where workers park at work <sup>e</sup>	
On the street	15
On a lot	77
In a garage	3
Other places	5
Whether have ever estimated cost per day for journey by car <sup>f</sup>	
Have	27
Have not	73
Estimate of cost per day (\$) <sup>g</sup>	
0.15 - 0.24	5
0.25 - 0.34	13
0.35 - 0.44	6
0.45 - 0.54	13
0.55 - 0.64	5
0.65 - 0.74	2
0.75 - 0.84	7
0.85 - 0.99	1
1.00 - 1.09	21
1.10 - 1.29	5
1.30 or over	22

<sup>a</sup>All parts of this table exclude those journeys to work where a particular characteristic was not ascertained.

<sup>b</sup>Based on 453 cars.

<sup>c</sup>Less than one half of 1 percent.

<sup>d</sup>Includes only the head's journey to work for his main job. If the head is not working, the journey to work of his wife or other relative is included. Based on 506 journeys to work. Median time = 18 min.

<sup>e</sup>Includes journeys to work by family members other than the head as well as journeys to work on second jobs by the head of the family. Based on 602 journeys to work.

<sup>f</sup>Includes only the head's journey to work for his main job. If the head is not working, the journey to work of his wife or other relative is included. Based on 510 journeys to work.

<sup>g</sup>Includes journeys to work by family members other than the head as well as journeys to work on second jobs by head of the family. Based on 135 journeys to work. Median cost/day = \$0.84.

number of trips; in contrast, those with income over \$15,000 average 8.3 vehicle-trips. These large differences among income groups are associated, of course, with differences in automobile ownership and location of place of residence.

Low vehicle-trip rates are characteristic of those aged over 65. The peak years are those when the head of the family is 45 to 54, no doubt because of the activities of adolescent children in the family.

Table 14 indicates the determinants of the number of vehicle-trips per family. The analysis has been carried only to the stage of estimating two-way relationships between values of selected family characteristics and the mean number of equivalent vehicle-trips per day.

Families who own a single automobile take about 2.8 more vehicle-trips a day on the average than families owning no car. Interestingly, the mean number of vehicle-trips by families who own two cars is 2.7 per day higher than that for those who own only a single car. The third car seems to lead to an increment of only 2.0 trips per day. This last estimate, however, must be regarded as tentative in view of the small number of three car families in the sample. An increase in the number of vehicle-trips as the number of vehicles increases was expected.

Since the number of automobiles owned is associated with the number of trips generated per day per family, the variables known to be associated with automobile ownership should also be associated with trip generation. Between the high density neighborhoods (apartment house neighborhoods) and the very low density neighborhoods (single-family houses surrounded by vacant land), the average number of vehicle-trips per family doubles. If attention is restricted to single-family homes, the data also show evidence of a systematic increase in the number of vehicle-trips per family associated with increases in the frontage of the lot. Whether the density effect would persist with other variables held constant is not investigated here. Oi and Shuldiner (5) believe density has no effect after allowing for size of family and vehicle ownership.

The effect of size of city and age of city is also in the expected direction. The average number of vehicle-trips is 2.7 for the old cities but 5.0 for the new.

The overall mean of 5.2 vehicle-trips per family corresponds to the mean for families with incomes in the neighborhood of \$6,000. Those with incomes below \$2,000 take less than one-third that num-

TABLE 16

COST PER MILE OF THE JOURNEY  
TO WORK BY CAR

\$ Per Mile <sup>a</sup>	Percent
Less than 0.05	14
0.05 - 0.099	33
0.10 - 0.149	21
0.15 - 0.199	11
0.20 or more	21

<sup>a</sup>Based on 132 estimates.

The mean number of vehicle-trips rises in a regular manner with the number of adults. As a first approximation the data fit a pattern of an average of about 2.5 vehicle-trips per adult. Using a somewhat different set of definitions, Oi and Shuldiner also found that the number of persons in the family had a strong effect on the volume of trips.

Journey to Work

The journey to work receives much attention because it accounts for a large volume of travel and the trips to and from work create the rush-hour peaks of traffic. The central problem considered here is the problem of choice of mode. Descriptions of the characteristics of the journeys to work by car and by common carrier, respectively, are followed by a discussion of the statistical effect of different variables on whether a car or a common carrier is used to get to work.

Selected characteristics of the journey to work by car are summarized in Table 15. The large number of cars on the road at rush hour is in part the result of the fact that most cars (90 percent) contain only one occupant. The median length of time for the trip to work by car is 18 min. Two-thirds of the trips take between 10 min and one-half an hour. While at work, most people (77 percent) park in a lot; the next largest group (15 percent) park on the street. Only 8 percent pay to park at work.

The last two parts of Table 15 deal with the cost of going to work by car. Respondents were asked: "Have you people ever estimated how much it costs per day for (the worker in question) to drive (or ride) to work?" To this question, 73 percent of the answers were that they have never calculated this cost. Undoubtedly, some have no choice but to go by car once location has been decided. For others the convenience and flexibility of a car may outweigh any cost considerations by a sufficient margin so that exact estimates do not seem worth the trouble.

The costs quoted by people who do say they have estimated them have been converted into cost in dollars per mile (Table 16). Those who made cost estimates were asked what they included and the results are given in Table 17. Eight percent mentioned a fee or charge for parking. Thus, a majority mentioned only costs which vary dependent on the number of miles driven, but a substantial minority included depreciation and other costs which do not vary in proportion to the number of miles driven.

The main result of the series of questions asked about costs, therefore, is that many people do not seem to know what it costs to drive to work, except in the most general way. Those who do give cost estimates mention figures which vary widely. This wide variation may reflect to some degree differences in people's situations, especially differences in whether the cost of driving to work should include operating costs only or the total cost of owning and operating a vehicle whose principal use is to get someone to work.

TABLE 17

ITEMS INCLUDED IN ESTIMATE OF  
COST OF JOURNEY TO  
WORK BY CAR<sup>a</sup>

Item	Percent
Gas, oil, grease only	50
Gas, oil, plus parking, tolls	3
Gas, oil, plus depreciation, repairs, wear and tear	25
Gas, oil, plus depreciation, repairs, wear and tear, plus license, insurance	6
Other items or combinations of items	16

<sup>a</sup>Based on estimates of 126 respondents.

TABLE 18  
CHARACTERISTICS OF JOURNEY TO WORK BY  
COMMON CARRIER

Characteristic <sup>a</sup>	Journeys to Work (%)
Distance from worker's home to common carrier stop (mi) <sup>b</sup>	
Less than 1/4	78
1/4 up to 1/2	8
1/2 up to 1	6
1 - 2.9	3
3 - 4.9	— <sup>c</sup>
5 - 9.9	4
10 or over	1
Distance from common carrier stop to worker's place of work (mi) <sup>d</sup>	
Less than 1/4	91
1/4 up to 1/2	6
1/2 up to 1	2
1 - 2.9	1
Frequency of common carrier service on way to work <sup>e</sup>	
Every 1 - 3 min	2
Every 4 - 5 min	6
Every 6 - 9 min	6
Every 10 - 14 min	13
Every 15 - 19 min	15
Every 20 - 29 min	24
Every 30 min	22
Longer intervals	12
On way home <sup>f</sup>	
Every 1 - 3 min	2
Every 4 - 5 min	3
Every 6 - 9 min	5
Every 10 - 14 min	16
Every 15 - 19 min	15
Every 20 - 29 min	25
Every 30 min	21
Longer intervals	13
Whether journey to work by common carrier is comfortable for worker <sup>g</sup>	
Very comfortable	4
Comfortable	59
Comfortable part of the time; comfortable in some ways, not others	7
Uncomfortable	28
Very uncomfortable	2
Whether journey to work is comfortable by whether worker gets a seat <sup>h</sup>	
Usually gets a seat <sup>i</sup>	
Comfortable	74
Comfortable part of the time; comfortable in some ways	5
Uncomfortable	21
Sometimes stands; usually stands	
Comfortable	24
Comfortable part of the time; comfortable in some ways	20
Uncomfortable	56

NOTES: (a) All parts of this table exclude those journeys to work where a particular characteristic was not ascertained. (b) Based on 224 journeys to work. (c) Less than one-half of one percent. (d) Based on 226 journeys to work. (e) Based on 216 journeys to work. (f) Based on 208 journeys to work. (g) The questions were: "Would you say the trip by (common carrier) is comfortable or uncomfortable for (worker)?" "Why do you say so?" Based on 212 journeys to work. (h) The questions were: "Once (worker) get on (common carrier), is (worker) usually able to gets a seat, or does (worker) have to stand?" (i) Based on 147 journeys to work. (j) Based on 41 journeys to work.

**Characteristics of Journey to Work by Common Carrier.**—Table 18 gives descriptive material regarding the trip to work by common carrier (rapid transit, bus, or suburban railroad). People who use a common carrier part of the time are included as well as those who always go to work by common carrier.

Most workers who travel to work by common carrier do not have to go far to catch the common carrier. About 78 percent of the workers live within a quarter mile of the stop or station. A few workers (5 percent) live more than 5 mi from the common carrier stop. These probably are people who live in suburbs and commute to work by train. At the other end of the trip to work, 91 percent of the workers can take the common carrier to within a quarter mile of their work place.

Both on the way to work and on the way home, common carrier service does not tend to be frequent. Few common carriers run more often than every 10 to 14 min; one-third run no more often than every 30 min at the time when people are leaving for work.

Although a majority of workers find the trip to work by common carrier comfortable, a substantial group (30 percent) find the trip uncomfortable. As Table 18 indicates, an important factor in determining comfort seems to be the availability of seats. People were asked if the worker usually gets a seat; of those who do, three out of four feel the trip is comfortable. Of those who do not get a seat, only one in four finds the trip comfortable.

**Choice of Mode for Journey to Work.**—This study was conducted only in metropolitan areas with a population of 50,000 or more. No doubt in most of these areas some sort of public transit system is available to the residents. Yet about 79 percent of all journeys to work in these areas are made by car, with the worker either driving or riding as a passenger. Only 9 percent of the workers use a common carrier exclusively for the trip to work.

The 1960 Census also included a question about the mode used on the journey to work. For all urban areas with a population of 2,500 or more, the distribution (including only those who go to work either by car or common carrier) was as follows:

Mode Used	Percent
Car	80
Railway, subway, elevated	6
Bus, street car	14



TABLE 19

## PRINCIPAL MODE USED FOR JOURNEY TO WORK

Family Characteristic	Auto	Common Carrier	Both Auto and Common Carrier <sup>a</sup>	Other <sup>b</sup>	No. of Journeys to Work <sup>c</sup>
Who made the journey					
Head of family	83	7	7	3	557
Wife of head	71	14	11	4	151
Other relatives	68	15	15	2	73
Family income(\$)					
Under \$3,000	50	32	13	5	39
3,000 - 3,999	47	39	7	7	28
4,000 - 4,999	79	7	10	4	53
5,000 - 5,999	78	7	10	5	96
6,000 - 7,499	87	5	6	2	131
7,500 - 9,999	80	8	9	3	166
10,000 - 14,999	84	5	10	1	179
15,000 and over	81	8	11	-d	94
Density of neighborhood					
Very low	91	-d	6	3	32
Low	86	4	9	1	504
Medium	67	16	12	5	115
High	54	27	13	6	82
Automobile ownership per adult					
No autos	17	56	17	10	71
More adults than autos	78	7	12	3	402
Adults equal to autos	94	1	3	2	295
Less adults than autos	100	-d	-d	-d	33
All	79	9	9	3	801

<sup>a</sup>Includes those who travel to work on some days by auto and some days by common carrier.

<sup>b</sup>Includes those who walk to work as well as those who go by taxi or by truck. Also includes 0.37 percent for whom the principal mode was not ascertained.

<sup>c</sup>Includes journeys to work by family members other than head as well as journeys to work on second jobs by head of family.

<sup>d</sup>Less than one half of 1 percent.

TABLE 20

## CHOICE MADE BETWEEN AUTO AND COMMON CARRIER BY THOSE WHO HAVE A CHOICE

Characteristic <sup>a</sup>	Use Common Carrier Although Could Use Car	Use Car Although Common Carrier	No. of Journeys to Work
All	22	78	221
Frequency of common carrier service			
Every 1 - 10 min or more often	52	48	23
Every 10 - 14 min	60	40	20
Every 15 - 19 min	12	88	25
Every 20 - 29 min	21	79	42
Every 30 min	14	86	43
At longer intervals than every 30 min	18	82	22
Whether car or common carrier is faster <sup>b</sup>			
Car is faster	13	87	159
Common carrier is faster; car and common carrier are equal in speed	55	45	22
Whether car or common carrier is more convenient <sup>c</sup>			
Car is more convenient	12	88	156
Common carrier is more convenient; car and common carrier are equal in convenience	65	35	20
Whether car or common carrier is more expensive <sup>d</sup>			
Car more expensive	21	79	75
Car and common carrier cost same	26	74	49
Common carrier more expensive	4	96	45

<sup>a</sup>All parts of this table exclude those journeys to work where a particular characteristic was not ascertained.

<sup>b</sup>The questions were: "Would it take the same amount of time for (worker) to get to work either way, or is one way faster?" "Which way is faster?" "How much difference in time is there?"

<sup>c</sup>The question was: "How do they compare in convenience?"

<sup>d</sup>The questions were: "How does this trip by (common carrier) compare with going by car in terms of total cost? Do they cost the same or is one more expensive than the other?" "Which is more expensive?"

The estimate of 80 percent by car and 20 percent by common carrier does not refer to the same population of trips as those studied here. The present inquiry is not directed to all urban areas, but to all Standard Metropolitan Statistical Areas, exclusive of New York. The passage of 3½ years from the spring of 1960 to the fall of 1963 also may have made some difference. However, the survey results are reasonably close to the Census. If anything, the survey has too few journeys to work by common carrier.

The point of interest here, however, is not the average proportion who go to work by car, but the determinants of the choice between modes. Two populations of trips have been studied with this question in mind. Table 19 indicates determinants of the principal mode used on the journey to work disregarding whether or not the worker feels he has a choice of modes. Table 20 gives data only for those workers who feel that they do have a choice of transportation to work. More questions could be asked in those interviews where a choice existed in the opinion of the person interviewed.

It would seem that the head of the family rates first priority with regard to using the car (Table 19). Eighty-three percent of the trips to work by family heads are made by car, compared to 71 percent of the trips made by wives and 68 percent of the trips by other relatives. This drop in the use of the car is accompanied by corresponding increases both in the use of common carriers and a combination of car and common carrier.

Income has a strong effect on the choice of mode up to the middle of the range. In the income groups under \$4,000, about 40 to 49 percent go to work by car alone whereas about one-third depend on the common carrier for transportation to work. In the income group \$10,000 to \$14,999, 84 percent of the workers go by car, and only 8 percent rely on the common carrier. People in the lower income groups are less likely to own a car than those in the upper income groups, and less likely to live in the suburbs, so it is not surprising that the former depend more on public transportation.

Age is also related to the mode used. With advancing age the car is used less and the common carrier more, pointing to a reluctance or inability on the part of older people to withstand the strain of rush-hour driving. But even in the age group 65 or over, of those who are working two-thirds depend on the car to get to work.

Density of neighborhood has a strong effect on choice of mode. Of those living in neighborhoods of very low density, 91 percent go to work by car, and not even one-half of one percent by common carrier. In high density neighborhoods only 54 percent rely on the auto exclusively.

As mentioned earlier, car ownership is certain to affect choice of mode for the journey to work. Table 19 indicates the relation between auto ownership and choice of mode. In families with no car, 17 percent ride to work as passengers in other people's cars. In families with at least one car, the percentage of auto users jumps to 78 percent. Finally, in families with more cars than adults, everyone, not surprisingly, uses a car to get to work.

Of the population of journeys to work studied, in 28 percent the worker reported that he had a choice of mode. Where such a choice was reported, questions could be asked about alternatives (Table 20).

If the common carrier runs frequently, a majority of the workers choose it, but when the frequency of service drops to every 15 min or less often, the proportion who use the common carrier drops from 50 to 60 percent to the range of 12 to 21 percent. People on the way to work cannot or will not wait 15 min or more for the bus or train. Headway of more than 15 min may be associated with other deficiencies or disadvantages, of course.

If the common carrier equals or surpasses the car with regard to speed, convenience or price, the worker is more likely to choose the public transportation. Of the three considerations the most important is speed. If the car is thought to be the faster way to get to work, 87 percent choose the car, and only 13 percent the bus or train. But if the car is thought to be no faster or slower, 45 percent choose the car and 55 percent the common carrier. Most people find the automobile faster, and act accordingly.

There are also large differences in choice of mode between those who say the car is more convenient, of whom 88 percent go by car, and those who say the car is no more convenient than the common carrier, of whom only 35 percent go by car. Again, the group giving answers unfavorable to the automobile is small.

TABLE 21  
COMPARISON OF WORK TRIPS BY AUTO IN LARGE CITIES, 1960 VS 1900

Largest Cities by Total Population, 1960 <sup>a</sup>	Percent Going to Work by Auto, 1960	Largest Cities by Population of Central City, 1900	Percent Going to Work by Auto, 1960
New York	36	New York	36
Los Angeles	91	Chicago	63
Chicago	63	Philadelphia	67
Philadelphia	67	St. Louis	81
Detroit	86	Boston	70
San Francisco	79	Baltimore	77
Boston	70	Pittsburgh	76
Pittsburgh	76	Cleveland	75
St. Louis	81	San Francisco	79
Washington, D. C.	73	Detroit	86
Cleveland	75	Washington, D. C.	73
Baltimore	77	Los Angeles	91

<sup>a</sup>Largest Standard Metropolitan Statistical Areas as defined by Census of Population.

The effect of relative cost is less striking. People who say that the automobile is more expensive, still drive to work in the ratio of four to one.

More thorough analysis of the data would require simultaneous consideration in a single statistical calculation of all factors relevant to choice of mode. It is unlikely, however, that such a calculation would change the finding that choice of mode depends more on how long it takes to get to work by each mode than on which is more expensive.

The choice of means to get to work as it is presented to the individual worker depends on the characteristics of the city in which he lives. It has been shown previously that the effect of the age of the city can be traced in this survey in tabulations giving automobile ownership and vehicle-trips per family. The relation between age of the city and choice of mode for the journey to work is most easily shown by the use of the 1960 Census of Population. Tabulations are available on a city or metropolitan area basis.

In the first column of Table 21 cities are ranked by their total population in 1960. The percent who went to work by auto in 1960 is given in the second column. The rank order correlation is poor. New York is largest in population and has the lowest proportion of automobile users, but Los Angeles, the second largest city, has the highest proportion going to work by auto.

In the second part of Table 21 the same cities are ranked by population of the central city in 1900, before the advent of the automobile. The rank order correlation with the percent going to work by auto in 1960 is much better. Los Angeles, for example, drops to the end of the list. The percent going to work by auto does rise, with occasional exceptions, as one reads down the column.

These relationships may emphasize the general proposition that people's preferences as they exist at present are not the only determinants of their behavior. Their choices must be made in urban environments created by past decisions whose consequences will continue to be felt in the future.

#### PRINCIPAL FINDINGS

1. Residential locations may be described by density and distance from city center. The existing pattern of location is influenced, but by no means fully determined, by family income and by stage in the family like cycle.

2. About one-half of metropolitan area families moved during the past 5 years, and a similar proportion plan to move during the coming 5 years. A large proportion of potential movers would like to move to less urbanized locations, farther away from the center of the city into a more rural setting.

3. The number of people wanting to move from an apartment to a single-family house is much larger than the number interested in the opposite change. The recent boom in apartment demand reflects demographic and financial changes, but not a shift in consumer preferences.

4. There is a widespread desire for vacation cottages or vacation homes, and a significant proportion of families, particularly in the upper income brackets, believe that they will be able to realize this wish.

5. The number of vehicle-trips per family in a 24-hr period is associated with family income, occupation of the head, age of the head of the family, the size of the lot, the density of the neighborhood, and the age of the city.

6. Automobile ownership and the mean number of miles the principal family car is driven per annum depend on income and to some degree on distance from city center and the age of the city.

7. Choice of mode for the journey to work does not appear to be sensitive to cost. Most people never have estimated the cost of driving to work; those who have made estimates report widely varying costs per mile.

8. People overwhelmingly say they would prefer to go to work by car rather than by common carrier if the cost were the same and the time were also the same. A frequent complaint about common carriers is that they are crowded; however, people like the freedom of movement and the convenience of travel by car.

#### ACKNOWLEDGMENTS

This study has benefited from suggestions made by Joseph Stowers and Michael Lash, Division of Urban Planning, U. S. Bureau of Public Roads.

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