

# Travel Characteristics of Persons Living in Larger Cities

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•THE PURPOSE of this paper is to examine some of the travel characteristics of workers now living in cities (exclusive of the surrounding urban areas) having a population of 100,000 and over. The data considered are the choice of travel modes used by workers related to the nearness to public transportation to work, the distance to work, and the family income of the workers. Also considered is the distribution of trips and travel to the downtown by purpose of trips and for each purpose the proportion of all trips destined for the downtown area.

The principal data on which this paper is based are derived from a nationwide automobile-use survey conducted in Spring 1961 by the Bureau of the Census under contract to the Bureau of Public Roads, supplemented by other information that has become available since that time.

The sample used by the Bureau of the Census for this study was one of approximately 5,000 dwelling units from the Current Population Survey. This survey, conducted monthly by the Bureau of the Census, is based on a statistically selected sample representing the noninstitutional civilian population. Its main purpose is to obtain current information on employment, unemployment, and related data compiled monthly. This paper reports on data obtained in over 1,300 households of the sample located in cities having a population of 100,000 and over. Because these data are based on a probability sample of households, the figures are subject to sampling variability, i. e., the expected differences between results of a sample survey and those that would have been obtained from a complete enumeration of all households. Based on the estimates of sampling variability from this survey in places having a population of 100,000 and over, there are about two chances in three of being right in assuming that the relative difference between the estimate of vehicle-miles by purpose yielded by this sample and the true value is approximately 20 percent of the estimate. The sampling error in the estimate of trips by purpose would be approximately 10 percent.

## BACKGROUND

It can be reasonably assumed that the major portion of highway needs of this country will be concentrated in urban areas in the next two or three decades, which is generally as far into the future as one cares or dares to look. It is highly probable that in 1990 about 80 percent of the total population of the 48 contiguous states and the District of Columbia will reside in urban areas.

Projections of future population growth show a range in total predicted population from 262 million to 301 million for the year 1990. A recent projection prepared by the U. S. Bureau of Public Roads resulted in a 1990 estimate of 286 million. If the probability of 80 percent of this number being residents of urban areas holds, this would mean an urban population of 230 million.

The planning and constructing of the urban highway system—or, for that matter, systems including all modes of urban transportation—to meet the travel needs and desires of 230 million persons is a task of unparalleled magnitude in transportation history. With more and more of the population living in urban concentrations, it

becomes increasingly necessary to plan the development of transportation systems embracing the various modes in a balance that will provide efficient and effective transportation service for states and local communities.

The study of travel habits of workers reported here sheds some light on preferences for certain modes of transportation and how these preferences may suggest the trend of future transportation development.

#### NEARNESS TO PUBLIC TRANSPORTATION

As indicated in Table 1, 69.3 percent of all workers living in cities having a population of 100,000 or more had some form of public transportation available within two blocks of their homes. At the other extreme, 8 percent had no available public transportation to work.

Of all workers, 87 percent had public transportation available six blocks or less from home. Furthermore, of the working population living 15 miles or more from work, 15.6 percent has no public transportation available nearer than six blocks from their home; for other distance groups less than 5 percent was reported in this category.

#### COMMUTING BY AUTOMOBILE

Half of all workers who have some form of public transportation to work available to them chose to use automobiles for this purpose, as indicated in Table 2. The percentage is even a little higher than the average in the case of workers living within two blocks of public transportation. Among possible reasons for this might be inadequacy of, or dissatisfaction with, the public transportation system.

The time factor may enter into the choice of the automobile as the means of getting to work. In the 1963 Passenger Transportation Survey by the Bureau of the Census, it was found that 74 percent of the persons commuting to work by automobile required less than 25 min to get there, whereas only 25 percent of the workers commuting by public transportation were able to get to work within this time.<sup>1</sup> These figures may be an indication of the value commuters attach to time savings.

TABLE 1  
DISTRIBUTION OF PERSONS ACCORDING TO DISTANCE TO  
NEAREST PUBLIC TRANSPORTATION TO WORK<sup>a</sup>

Distance to Work One Way (mi)	Distance to Nearest Public Transportation to Work				
	1 to 2 Blocks (%)	3 to 6 Blocks (%)	Over 6 Blocks (%)	None Available (%)	All Dist. (%)
Under 5	71.7	15.5	2.8	10.0	100.0
5.0 - 9.9	69.0	23.0	4.7	3.3	100.0
10.0 - 14.9	71.5	19.5	3.0	6.0	100.0
15.0 and over	56.2	13.9	15.6	14.3	100.0
All distances	69.3	18.0	4.7	8.0	100.0

<sup>a</sup>Nationwide automobile-use survey of locations having populations of 100,000 and over, spring 1961.

<sup>1</sup>Preliminary Progress Report, Home to Work Travel Survey, 1963 Census of Transportation; data shown are for central cities of Standard Metropolitan Statistical Areas.

TABLE 2  
 PERCENTAGE OF PERSONS USING AUTOMOBILE FOR WORK BY  
 DISTANCE TO NEAREST PUBLIC TRANSPORTATION TO WORK<sup>a</sup>

Distance to Work One Way (mi)	Distance to Nearest Public Transportation to Work <sup>b</sup>			
	1 to 2 Blocks (%)	3 to 6 Blocks (%)	Over 6 Blocks (%)	All Distances (%)
Under 5	44.8	46.1	56.7	45.4
5.0 - 9.9	61.2	41.1	39.7	55.3
10 - 14.9	54.3	60.3	51.4	55.4
15.0 and over	53.6	60.3	31.6	50.7
All distances	51.5	47.3	42.8	50.2

<sup>a</sup>Nationwide automobile-use survey of locations having populations of 100,000 and over, spring 1961.

<sup>b</sup>Excludes persons for whom no public transportation is available.

#### COMMUTING BY ALL MODES

Of the one-half of all workers who did not elect to go to work by automobile, 38.6 percent used public transportation and 11.5 percent walked to work or used a bicycle, as indicated in Table 3. Where the distance to work was under 1 mi, three-fourths of the workers either walked or rode a bicycle. But even at this relatively short distance from home to work, 14 percent chose to go by automobile as compared with 11.1 percent by public transportation. Moreover, most of those who went by automobile were drivers rather than passengers.

Table 3 indicates the mode of travel to work in 1-mi increments up to 5 mi and then in 5-mi increments. Generally, the greater the distance from work the larger the proportion of workers using automobiles for home-to-work transportation. The table also indicates that mileage to work influences the extent of car pooling. As the distance to work increased above 3 mi, a higher proportion of persons were reported as automobile passengers, the range being from 5.4 percent in the 4.0 to 4.9 mileage group to 12.7 percent in the 20.0 to 24.9 mileage group.

TABLE 3  
 DISTRIBUTION OF WORKERS CLASSIFIED BY MODE OF TRAVEL, ACCORDING TO ONE-WAY DISTANCE TO WORK<sup>a</sup>

Distance to Work One Way (mi)	Automobile			Public Transportation or Combination <sup>b</sup> (%)	Walk or Bicycle (%)	Total (%)
	Driver (%)	Passenger (%)	Total (%)			
0.1 - 0.9	13.1	0.9	14.0	11.1	74.9	100.0
1.0 - 1.9	40.2	4.8	45.0	30.0	25.0	100.0
2.0 - 2.9	41.3	2.1	43.4	51.8	4.8	100.0
3.0 - 3.9	51.0	8.6	59.6	38.7	1.7	100.0
4.0 - 4.9	55.5	5.4	60.9	39.1	-	100.0
5.0 - 9.9	48.6	8.5	57.1	42.3	0.6	100.0
10.0 - 14.9	50.5	7.2	57.7	42.3	-	100.0
15.0 - 19.9	41.3	8.1	49.4	50.6	-	100.0
20.0 - 24.9	52.8	12.7	65.5	34.5	-	100.0
25.0 and over	55.4	8.6	64.0	36.0	-	100.0
Unknown <sup>c</sup>	19.7	19.7	39.4	57.4	3.2	100.0
Total	43.2	6.7	49.9	38.6	11.5	100.0

<sup>a</sup>Nationwide automobile-use study of locations having a population of 100,000 and over, spring 1961.

<sup>b</sup>Public transportation alone or public transportation with automobile.

<sup>c</sup>Distance not reported (amounted to less than 3 percent of those reporting).

TABLE 4  
DISTRIBUTION OF PERSONS CLASSIFIED BY FAMILY INCOME AND BY METHOD OF HOME-TO-WORK-TRANSPORTATION<sup>a</sup>

Family Income	Automobile			Public Transportation or Combination <sup>b</sup> (%)	Walk or Bicycle (%)	All Means (%)
	Driver (%)	Passenger (%)	Total (%)			
Under \$1,000	15.9	4.7	20.6	25.1	54.3	100.0
\$ 1,000 - \$ 1,999	14.1	-	14.1	71.7	14.2	100.0
\$ 2,000 - \$ 2,999	18.9	3.0	21.9	57.5	20.6	100.0
\$ 3,000 - \$ 3,999	26.7	8.5	35.2	51.5	13.3	100.0
\$ 4,000 - \$ 4,999	36.6	12.0	48.6	41.4	9.0	100.0
\$ 5,000 - \$ 9,999	50.0	9.1	59.1	31.2	9.7	100.0
\$10,000 - \$14,999	54.3	1.9	56.2	36.6	7.2	100.0
\$15,000 and over	63.3	-	63.3	36.7	-	100.0
Unknown <sup>c</sup>	41.7	4.2	45.9	39.8	14.3	100.0
Totals	43.2	6.7	49.9	38.6	11.5	100.0

<sup>a</sup>Nationwide automobile-use study of locations having a population of 100,000 and over, spring 1961.

<sup>b</sup>Public transportation alone or public transportation with automobile.

<sup>c</sup>Income not reported (amounted to 13 percent of sample).

FAMILY INCOME AND MODE OF TRAVEL

The choice of mode of travel to work is undoubtedly influenced by many factors, singly or in combination. It is highly probable that at least two and possibly more of these factors enter into any given situation. Income is an important factor both in the choice of methods for going to work and in the distance between the worker's home and his place of employment. As indicated in Table 4 and Figure 1, where annual family income was under \$1,000, more than half of all workers walked or bicycled to work. It is possible that the under \$1,000 family income group were domiciled at the job site. The data, however, did not show this. In the next income bracket (\$1,000 to \$1,999), there was a very substantial shift to public transportation, with almost 72 percent of the workers using this mode. The percentage of workers using public transportation drops rather sharply until family income reaches \$10,000 at which point it increases somewhat.

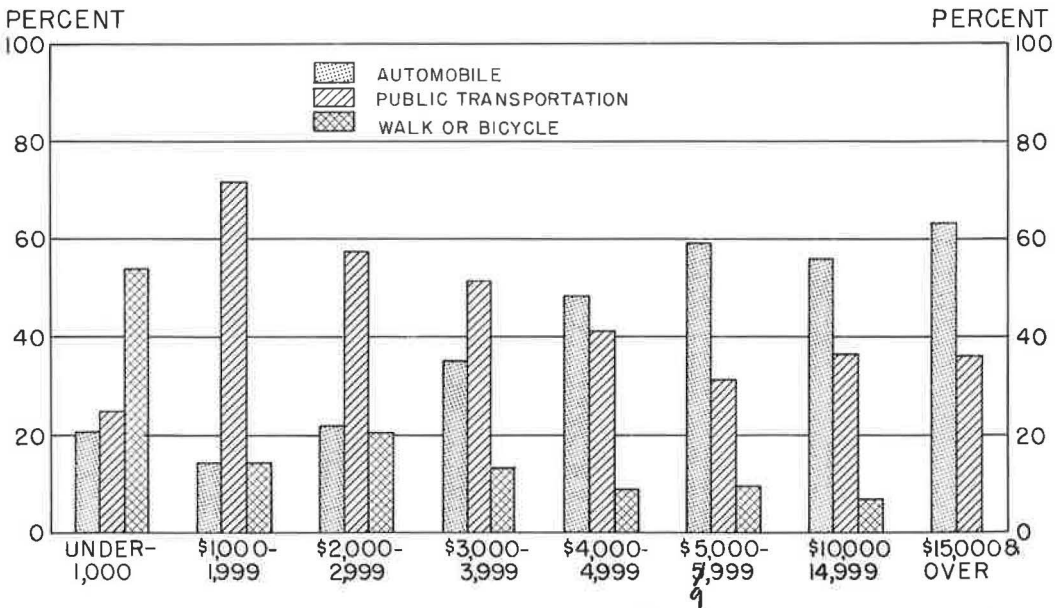


Figure 1. Distribution of persons in each family income group by method of home-to-work transportation.

ERRATA

Highway Research Record No. 106

On page 22:

EDMOND L. KANWIT and DAVID M. GLANCY, U. S. Bureau of Public Roads  
should read:

EDMOND L. KANWIT, U. S. Bureau of Public Roads, and  
DAVID M. GLANCY, D. C. Department of Highways and Traffic

In Figure 1, page 55, the family income group reading "\$5, 000-5, 999," should  
read "\$5, 000-9, 999."

As the size of family income increases, the choice of the automobile as a commuting mode increases and 63 percent of the persons having family incomes of \$15,000 and over used automobiles for trips to work. Surprisingly, over 20 percent of the lowest income group commuted by automobile with more than three-fourths of that total driving. The higher relative use of automobiles for home-to-work transportation as the family income exceeds \$5,000 may be noted in Figure 1, which shows the distribution of persons in each income group according to the mode of home-to-work transportation. Except for the family income group under \$1,000, where 54 percent of the workers reported they walked or bicycled to work, the income groups were relatively consistent in the proportion of walkers. One might conclude that income above the \$1,000 level is not closely related to walking to work.

#### PURPOSE OF TRIPS BY INCOME GROUPS

Family income is generally considered an important determinant of the use of automobiles. Table 5 indicates the distribution of automobile trips by purpose for the various income groups.

The proportion of trips related to earning a living rose from 24.7 percent for the family income group under \$1,000 to 42.6 percent for the \$4,000 to \$4,999 income group and then drops off steadily to 33.7 percent for the income group above \$15,000. Persons in the family income groups under \$2,000 made a higher proportion of the trips for family business purposes than did other income groups. Social and recreational trips accounted for 16.7 percent of all trips with the highest and lowest income groups both reporting 22 percent of the trips for such purposes.

#### TRIPS AND TRAVEL BY AUTOMOBILE TO DOWNTOWN SHOPPING AREAS

Urban planners are constantly aware of the problems of keeping traffic flowing to and in the central business districts. Although, with the tremendous buildup of suburban shopping and medical areas the relative attraction to a downtown shopping area has decreased, the downtown areas still attract people for a variety of reasons. Table 6 indicates, by purpose of trips, the distribution of trips and travel by automobile to downtown shopping areas by one-way distance groups. Over one-half of all the trips and travel to the downtown shopping areas were made for purposes of earning a living, with an additional one-third for family business purposes. Only 2.1 percent of the

TABLE 5  
DISTRIBUTION OF AUTOMOBILE TRIPS BY PURPOSE AND FAMILY INCOME GROUPS<sup>a</sup>

Purpose of Trip	Family Income								
	Under \$1,000 (%)	\$1,000 1,999 (%)	\$2,000 2,999 (%)	\$3,000 3,999 (%)	\$4,000 4,999 (%)	\$5,000 9,999 (%)	\$10,000 14,999 (%)	\$15,000 and Over (%)	All (%)
Earning a living:									
To and from work	16.2	26.5	30.6	34.9	37.7	36.3	33.8	29.0	34.5
Related business	8.5	1.7	7.2	6.1	4.9	3.5	5.3	4.7	4.4
Total	24.7	28.2	37.8	41.0	42.6	39.8	39.1	33.7	38.9
Family business:									
Medical and dental	3.1	2.1	3.6	1.4	1.2	2.1	1.9	3.4	2.1
Shopping	18.1	23.5	15.2	16.2	13.7	14.1	14.2	17.7	14.9
Other	20.3	18.9	18.5	14.1	14.3	15.0	15.1	12.0	15.1
Total	41.5	44.5	37.3	31.7	29.2	31.2	31.2	33.1	32.1
Educational, civic, and religious	11.6	8.7	11.7	10.4	11.2	12.9	13.1	11.1	12.3
Social and recreational:									
Vacations	-	-	-	-	-	0.1	-	-	-
Pleasure rides	3.2	2.1	1.6	2.8	2.9	1.9	1.6	3.2	2.1
Other	19.0	16.5	11.6	14.1	14.1	14.1	15.0	18.9	14.6
Total	22.2	18.6	13.2	16.9	17.0	16.1	16.6	22.1	16.7
All purposes	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

<sup>a</sup>Nationwide automobile-use study of locations having a population of 100,000 and over.

TABLE 6  
DISTRIBUTION OF TRIPS AND TRAVEL BY AUTOMOBILE TO DOWNTOWN SHOPPING AREAS CLASSIFIED  
BY ONE-WAY DISTANCE AND BY MAJOR PURPOSE OF TRIP<sup>a</sup>

One-way Distance from Residence (mi)	Purpose of Trips and Travel									
	Earning a Living		Family Business		Educational, Civic and Religious		Social and Recreational		All Purposes	
	Trips (%)	Travel (%)	Trips (%)	Travel (%)	Trips (%)	Travel (%)	Trips (%)	Travel (%)	Trips (%)	Travel (%)
0.1 - 1.9	28.6	29.7	62.8	61.7	1.1	0.9	7.5	7.7	100.0	100.0
2.0 - 4.9	58.1	57.2	30.3	30.6	2.5	2.6	9.1	9.6	100.0	100.0
5.0 - 9.9	51.7	54.5	36.3	34.3	1.7	1.8	10.3	9.4	100.0	100.0
10.0 and over	50.9	52.5	35.5	34.3	2.2	1.8	11.4	11.4	100.0	100.0
Total	51.9	53.5	36.3	34.0	2.1	1.9	9.7	10.6	100.0	100.0

<sup>a</sup>Nationwide automobile-use study in locations having populations of 100,000 and over.

TABLE 7  
PERCENTAGE OF AUTOMOBILE TRIPS FOR EACH  
PURPOSE DESTINED TO THE DOWNTOWN AREA<sup>a</sup>

Purpose of Trip	% to Downtown Business Area
Earning a living:	
To and from work	13.7
Related business	20.5
All trips for earning a living	14.5
Family business:	
Medical and dental	13.8
Shopping	13.1
Other	16.6
All trips for family business	14.5
Educational, civic, and religious	2.6
Social and recreational	6.7
All trips	12.0

<sup>a</sup>Nationwide automobile-use study of locations having a population of 100,000 and over, spring 1961.

trips and 1.9 percent of the travel to the downtown shopping areas were made for educational, civic and religious purposes. Trips for social and recreational purposes amounted to 9.7 percent of the trips and 10.6 percent of the travel.

By mileage-distance groups it was found that persons living closer to the downtown shopping areas, that is, under 2 mi, made a smaller proportion of automobile trips for work and a larger proportion of trips for family business purposes than persons living farther from the downtown.

Table 7, although not indicating the distance to downtown shopping areas, does give the percentage of total trips destined for the area by purpose of trip. A fairly substantial share of total trips, 12 percent, were destined to the downtown area.

Of all trips related to earning a living, 14.5 percent are to the downtown area. The same percentage of the trips for family business are to the downtown area. Trips for educational, civic, and religious purposes comprised less than 3 percent of downtown trips; but 6.7 percent of social and recreational trips were made to the downtown area.

## CONCLUSIONS

Information related to travel characteristics of residents of large cities obtained from sources valid for nationwide (but not local) comparisons has been presented in this paper. From this information it may be concluded that the automobile is the mode of transportation used by a large proportion of the residents of our large cities, regardless of the availability of other modes. The fact that a worker lives close to public transportation does not necessarily result in his use of it as his regular means of getting to and from work. Neither does closeness of home-to-work by itself cause a worker to forego use of his automobile for work trips. Use of the automobile for work trips tends to increase with income.

Although only one-seventh of all automobile trips made for purposes of earning a living were destined for the downtown area, more than half of all the trips with downtown destinations were for this purpose.