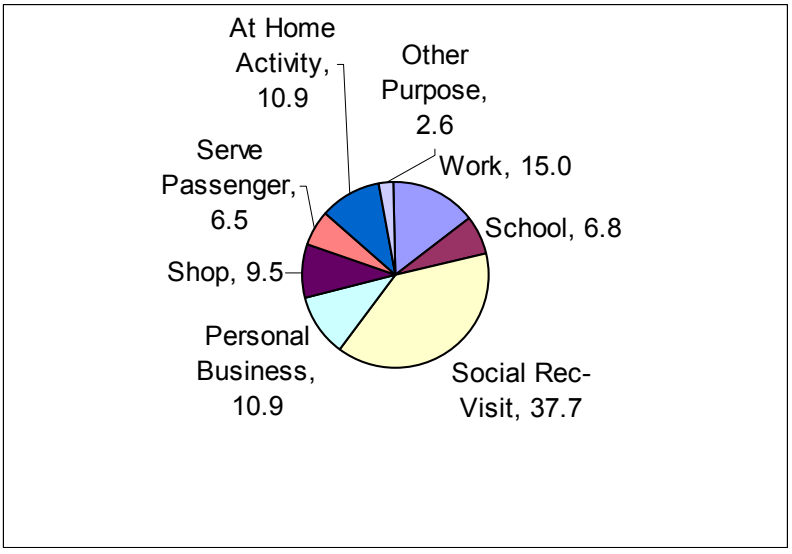
TRAVEL PATTERNS REVEALED BY THE 1997/98 HOUSEHOLD INTERVIEW SURVEY

Comprehensive travel patterns for the region were surveyed in 1997/98 for the first time in 35 years, while journey to work travel has been surveyed every ten years by the U.S. Census. The 1997/98 survey is called the Regional Travel-Household Interview Survey (RT-HIS). This survey found that "Work" trips comprise about 30 percent of all trip purposes (considering both work origins and work destinations, i.e., both trips to and from "Work"), and 45% of the Person-Miles of Travel (PMT). Although the other trip purposes comprise 70 percent of the trips, they produce 55% of the PMT. NYMTC's Household Interview Survey provides detailed and comprehensive information needed on all trip purposes, but is generally useful at the county level of geographic summary. The U.S. Census Journey-to-Work Survey has provided a very useful time series (every ten years) since 1960, and reveals work travel patterns at a smaller level of geographic detail, but it omits travel associated with non-Work purposes. *Figure A* indicates trips to work, plus the other trip purposes and the relative shares.

Figure A **Trip Purpose** at Destination for the NYMTC Region



Intracounty trips comprise the largest portion of trip patterns in the region, and work-related trips are 23 percent of these. However, work-related trips are almost 30 percent of all regional trips, and 45% of all regional person-miles of travel. Some counties such as Westchester, Nassau, New York, Queens, Kings, and the Bronx have high rates of transit usage for intracounty trips. Some counties have high rates of transit usage for intercounty trips; trips from various origins to New York County, and Nassau to Queens. Notable reverse commute patterns are seen in Queens to Nassau, and the Bronx to Westchester.

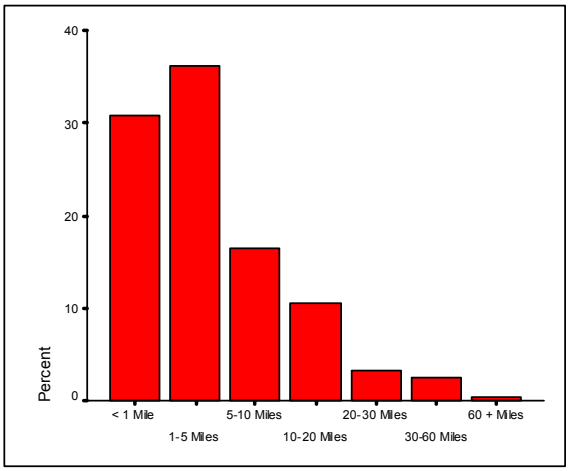
TRAVEL DISTANCES, by PURPOSE and SUB-REGION.

The word "travel" implies distance, not just the act of stepping out the door. (Remember "Where did you go? - Out" and "What did you do? - Nothing!".) The 1997/98 Regional Travel - Household Interview Survey asked the sample persons a lot of questions about where they went and what they did, plus when they did and how (what modes) they did it. A summary of the answers regarding travel distances, purposes, and modes has been abstracted as follows:

Trip Distance Ranges

A frequency distribution bar graph of trip distances by residents of the NYMTC Region for all purposes and by all modes is shown here. While the class interval is not uniform (it starts at 0 up to 1 mile, then shows 1 to 5 miles, then 5 to 10 miles, then increases to two 10 mile increments followed by a 30 mile increment, and lastly a 60 plus miles increment), it is seen that most trips are between 1 and 5 miles in distance, followed closely by the class of trips under one mile. The length of trips declines quickly after the 5 mile delineator, and then the decline persists, but gradually moderates at very low levels (it appears to be about 1% of trips beyond 50 miles, but the sampling variability does not allow precision estimates beyond the 20 mile delineator.). In "exponential decay" terms, the "half-life" of trips appears to be a bit under three miles.

Figure 1: Trip Distance for **All Purposes**



Work versus Non-Work Trip Distances.

A comparable frequency distribution bar graph shows that Work trips as a class have longer distances than Non-Work trips. 75% of Non-Work trips have distances under 5 miles, while Work trips show only 46% under 5 miles. The 75th percentile of Work trips is approximately 12 miles. 88% of Work trips are up to 20 miles long, but a comparable 88% of Non-Work trips are half that long, that is, they are 10 miles or less. We can conclude that Work travel has an impact or demand level about twice as heavy as Non-Work travel. If we were to further evaluate the observed relative time compression of Work travel into the "rush hours" or "peak periods" of observed travel (which can be measured by traffic counts, aerial observations, or crudely by "everyman's survey through the windshield"), we would also see that the hours when work travel occurs have the heaviest relative traffic density, and require the maximum supply of travel facilities. So there is a great deal of usefulness to "Journey to Work" surveys, but as we have

already stated, they are not the whole picture (just the heaviest part).

Figure 2: Work Trip Distance

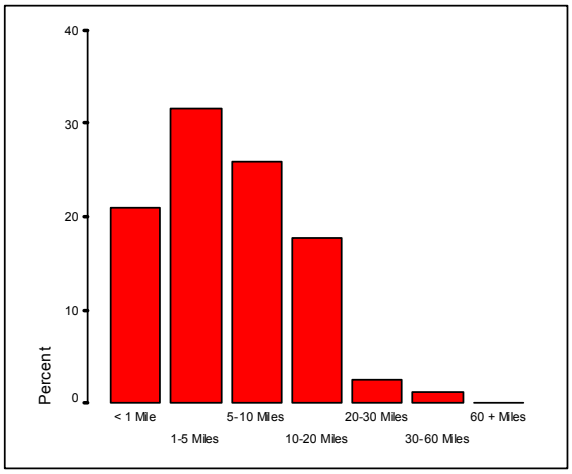
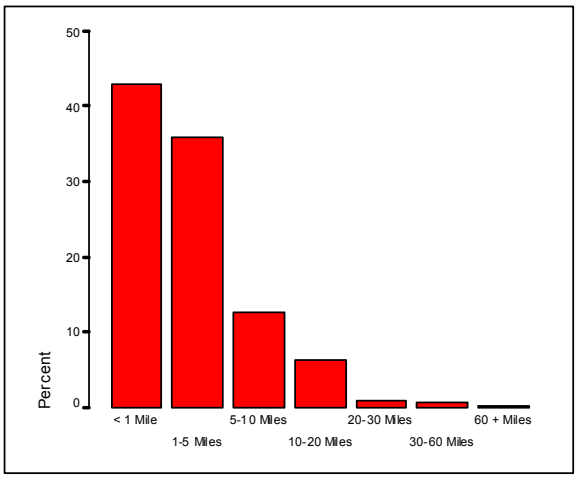


Figure 3: Non-Work Trip Distance



All Purpose Travel by Sub-Region

A comparison of "Trip Distance" bar graphs for all purpose travel is shown for New York City, for Long Island (Nassau and Suffolk Counties), and for the Mid-Hudson South (Westchester, Rockland, and Putnam) Sub-Regions. While Long Island and Mid-Hudson South appear similar (they are, after all, suburban in development character), New York City is noticeably different, with a much shorter average trip length. In the City, the most predominant trip length
is the class under 1 mile, but this is not so in the suburbs.

Figure 4: New York City All Purpose Travel

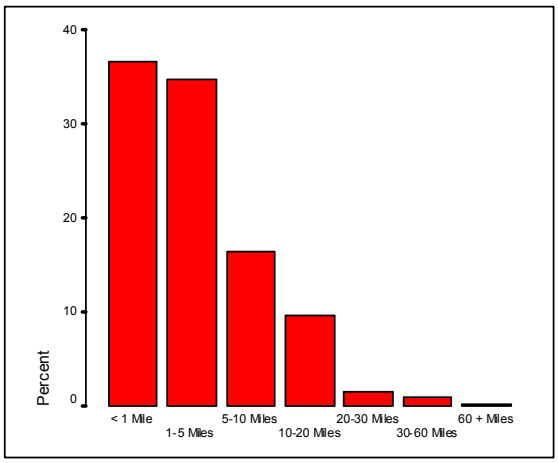


Figure 5: Long Island All Purpose Travel

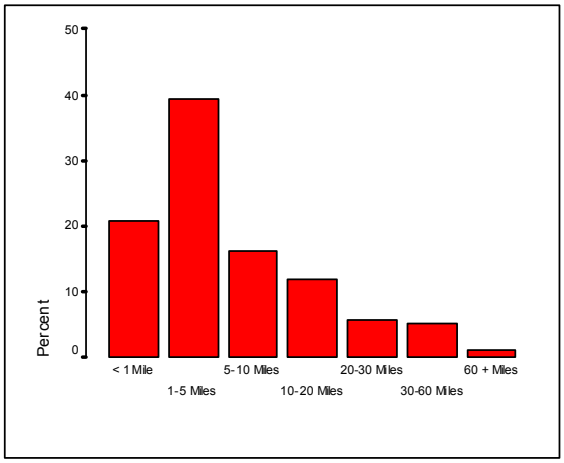
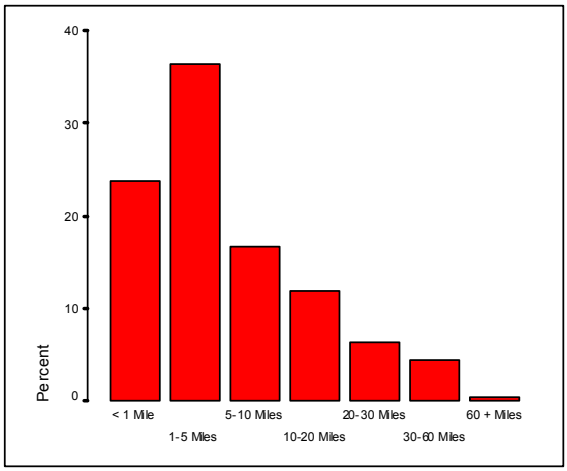


Figure 6: Mid-Hudson South All Purpose Travel



Work Travel versus Non-Work Travel Distances compared for Sub-Regions

The pattern of distances for Work trips versus Non-Work Trips is fairly similar for the two suburban Sub-Regions, but New York City shows a markedly shorter trip length for Non-Work travel. Work travel in the City drops of sharply after the 20 mile line, but below that, it is not much different than the other Sub-Regions. This is explained in terms of a high percentage of walking trips for Non-Work purposes, and a very small amount of Work travel leaving the City to work in the suburbs.

Figure 7: NYC Work Travel Distance

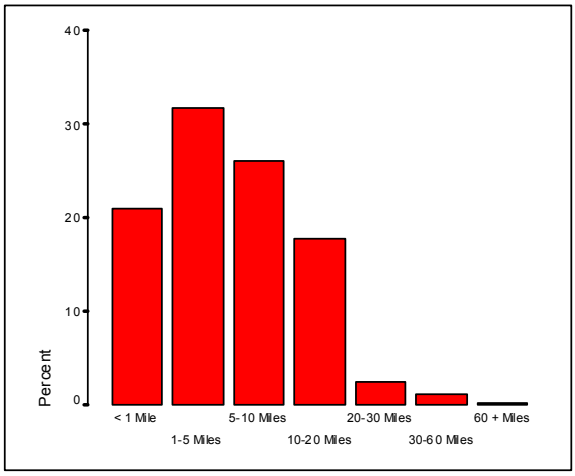


Figure 8: NYC Non-Work Travel Distance

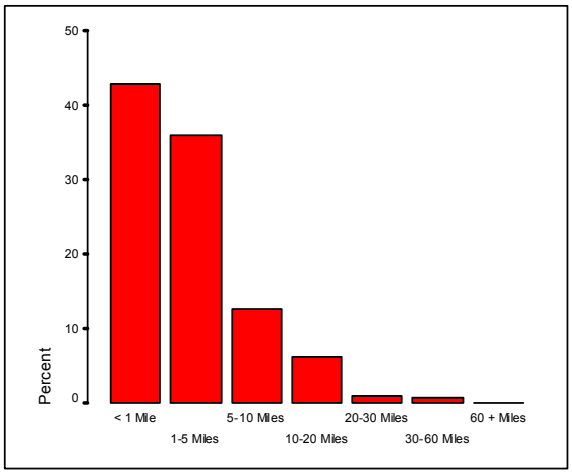


Figure 9: Long Island Work Travel Distance

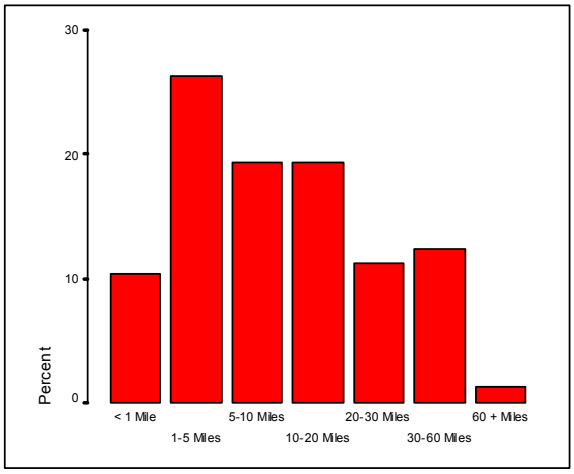


Figure 10: Long Island Non-Work Travel Distance

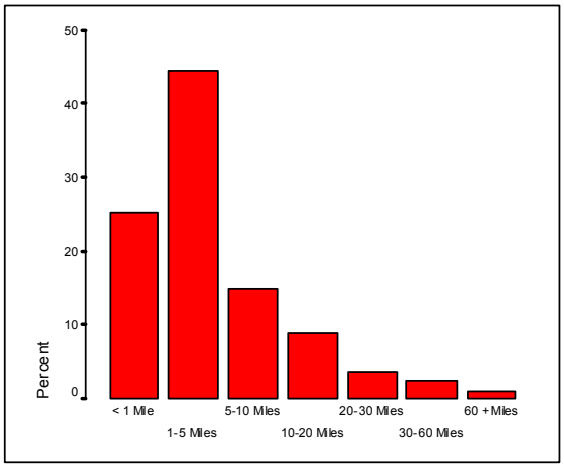


Figure 11: Mid-Hudson South Work Travel Distance

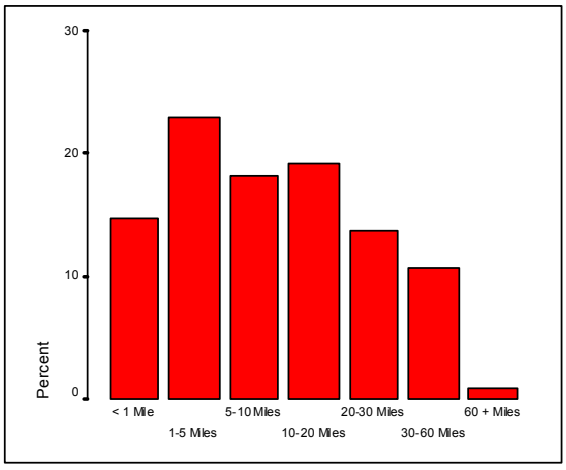
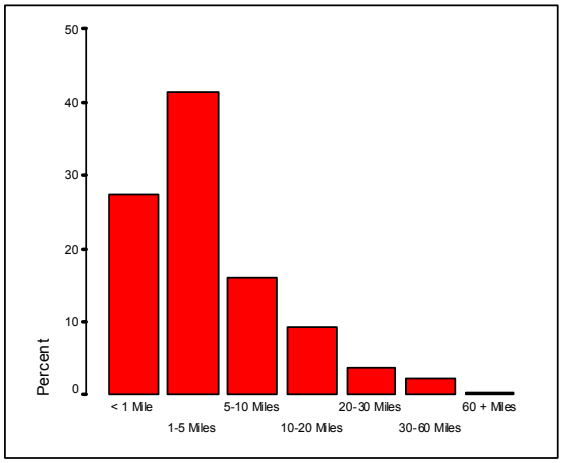


Figure 12: Mid-Hudson South Non-Work Travel Distance



TRAVEL DISTANCES BY MODE

When all the Person-Miles of Travel (PMT) in the NYMTC Region are arrayed by the category of Mode, the Automobile Driver is seen to comprise about half of the market. This mode can probably claim the title of majority, although only by the thin margin of less then 1%. The runner-up position is captured by the Automobile Passenger mode category, although this is only one-third of the size of the Auto Driver miles of travel, looking at all purposes of travel.

Subway and "Other Rail" (including SIRT in Richmond County) claims a close third place at 13.3% of the whole PMT market, while Commuter Railroad handles about half as much at 7%.

Walk (only) is the mode used for 3.2% of the miles of travel, and this is principally in Manhattan, plus other very dense localities, and is much less in the other parts of the Region.

School bus, Local Bus, and Express Bus handle 7.3% of the Region's PMT, while Taxis, Group Rides, and Other handle less than 2% of the PMT. Ferry, including the venerable Staten Island Ferry as well as the revived ferries making their comeback in the last two decades (*but pre-9/11/01)*, carry about one half of one percent of the Regional PMT. Of course, a large portion of the *transit* market involves more than one mode, so in this discussion, we are using a hierarchical definition to indicate the predominant mode in one category, so as to avoid the great complexity of accounting for the various permutations of the possible combinations of multiple mode usage. *This may inflate slightly the mileage shown for the transit modes, where autos are used to access the transit stop in many typical suburban situations. Likewise, it deflates very slightly the PMT done by walking, especially in dense urban situations.* The main thing to keep in mind here, however, is the fact that One Auto Driver mile produces one Vehicular mile of travel, which is the basic unit of demand on the highway/roadway/street network. Auto *Passenger (not Driver) Miles are essentially free,* in this context. So what else can we learn about auto *passengers* and *transit passengers* from the Survey? A great deal, if we break down the travel into its Work and Non-Work components.

Work Travel by Mode compared to Non-Work Travel by Mode

When we separate the purpose of travel into the two major components of Work versus Non-Work related purposes, there is a large area of similarity, namely, the relative share of Auto Driver PMT in each of the two cases. There is an observable difference in that Auto Driver work travel is 46% of the Work PMT, while Auto Driver Non-Work travel is 57% of the Non-Work PMT, but the most astounding difference is that the Auto Passenger PMT for Non-Work is 26%, while for Work Purposes it is only 4%! Complementing this is the sharp difference of 13% Commuter Railroad market share for Work purposes, but only 2.5% for Non-Work travel. The overall share of the other transit modes is virtually the same (in total) for Work or Non-Work, but there is obviously a shift among the transit modes for the two different purposes, where the Subway majors in Work, while the Bus modes major in Non-Work. ("Walk only" also doubles its share in Non-Work, compared to Work.) In a "nutshell", one can say that the modal share patterns are almost the same for Work versus Non-Work, except for almost a quarter of the market, where the Auto Passenger and the Commuter Rail shares do a flip-flop between the Work Purpose and the Non-Work Purpose markets. This would intuitively appear to also be a function of the travel distances, respectively, of these two different markets. A statistical analyst could also say that there is a good deal of "colinearity" in this regard. None of this is that surprising in qualitative terms, but here we are posting the quantitative results of the 1997/98 Regional Travel Survey, a major benchmark in our time!