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# RESEARCH RESULTS DIGEST

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## Trends in Single-Occupant Vehicle and Vehicle Miles of Travel Growth in the United States

*This TCRP digest summarizes the results of TCRP [Project H-13B](#), "Trends in Single-Occupant Vehicle and Vehicle Miles of Travel Growth in the United States," conducted by Charles River Associates, Inc*

### INTRODUCTION

This digest presents key findings from the recently completed TCRP Project H-13B, "Trends in Single-Occupant Vehicle (SOV) and Vehicle Miles of Travel Growth in the United States." The research developed trends and predictions of drive-alone commuting in the United States and addressed the policy implications that will be useful to transportation planners and decisionmakers.

The trend in recent years has been for population and employment to become more concentrated in metropolitan areas; however, this concentration has become aggregated in diffuse suburbs rather than dense central city areas. A far larger array of origins and destinations must now be served for commuting trips, and this has made both carpooling and conventional transit use far less feasible. Increasing incomes, falling real gasoline prices, and ever-increasing vehicle availability have at the same time made the private car an even more attractive option, and all of these trends are reflected in the commuting statistics. The average occupancy of private vehicles has been declining, as has the share of work trips taken by public transit. Even more pronounced, however, has been the increase in the number of work trips made by *driving alone*, adding 22 million vehicles to the nation's roads over the 1980s. Driving alone is now the mode of choice for almost three-fourths of all U.S. commuters.

TCRP Project H-13B examines these

developments and explores their relationship to some of the many influences affecting travel decisions. The objective of the study was to provide a stronger *quantitative* understanding of the factors that have been affecting the dynamics of commuter mode choices and vehicle occupancy levels in recent years, and to assess the role of public policy in the trends we observe. On the basis of this quantitative analysis, the study offers comments on the potential efficacy of policies designed to increase transit ridership and/or to increase average vehicle occupancy levels.

### STUDY METHOD

Econometric models of commuter mode choice, vehicle occupancy, and vehicle miles traveled (VMT) were estimated using a dataset representing the 33 largest metropolitan areas in the United States. This dataset include Journey-to-Work data from the 1990 Census that allow the analysis of commuting patterns at the subregional level of geography. Specifically, separate models were estimated for the *suburb-to-central city* and *within-central city* commute markets--the two markets historically of primary importance to public transit systems. Models were also estimated based on *changes* in mode shares, occupancies, and VMT across metropolitan areas between 1980 and 1990.

This cross-sectional analysis was supplemented by time series models based on cordon counts of commuting travel into New York City,

the country's largest commuting market, responsible for more than one-third of national transit trips. A large number of possible influencing factors were tested in developing each of the models, including various measures of

- housing and workplace dispersion,
- vehicle availability,
- relative vehicle costs,
- private vehicle and transit service levels, and
- household and demographic characteristics.

## SUMMARY OF RESULTS

The results of the study confirmed that development patterns, vehicle availability, and price and service levels are all important determinants of mode shares and occupancies. Specifically, the models indicate that transit service levels can have a significant impact on SOV shares, and that downtown parking prices are also a powerful deterrent to driving alone. The time series models of SOV share for New York City also indicate that in this highly transit-competitive market, SOV share is sensitive to automobile operating costs in the form of tolls and gasoline prices. Growth in VMT is explained by increases in population and employment, housing density, and rising household incomes.

## IMPLICATIONS FOR PUBLIC POLICY

The modeling results indicate that the trends in market shares and occupancies observed over the last 20 years can be explained in large part by factors that are beyond the direct control of *transportation* policymakers. On the other hand, there is some evidence to indicate that variables within the control of policymakers may also have been

important in influencing the trends examined, and that they could be an even more important influence on these trends in the future. For example, the models provide evidence that HOV facilities may actually *encourage* ridesharing, rather than just offer a convenient faster alternative for the few carpools that already exist. The results also indicate that increased transit *service levels* may help reduce the amount of SOV commuting, but that transit *fares* are a less important determinant of commuting market shares.

In addition, the time series results for New York City imply that in a transit-competitive environment, prices do matter. The results indicate that at least one-half of the variation in the observed SOV share can be explained by changes in relative prices, accounting for both the cost of the private vehicle mode and the cost of competing transit service. The models also indicate that *parking* prices are an important factor in explaining transit market share. The study discusses the implications of all these results for the efficacy of transit fare and service policies, parking-pricing initiatives, and road-pricing proposals.

Finally, while several of the most important factors driving the observed commuting trends are outside the direct control of transportation policymakers, the influence of several of them may already be diminishing. The labor force growth that has fueled increases in VMT has already slowed dramatically, the falling household sizes that affect carpooling have stabilized, and vehicle availability appears to be reaching a saturation level.

## REPORT AVAILABILITY

The full text of TCRP Report H-13B is available online as *TCRP Web Document 5* at [www2.nas.edu/trbcrp](http://www2.nas.edu/trbcrp). This Internet address also provides information about other TCRP reports and activities.