# ECONOMICS OF CAR OWNERSHIP AND USE BY TEENAGERS 

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## ABRIDGMENT


#### Abstract

Disaggregate income and expenditure data were produced as part of a comprehensive, exploratory study of subgroup travel behavior and mobility barriers. Information from small panels of 50 white male high school students from 3 working-class Boston suburbs generated insights that could help refine the analysis of metropolitan lransportation planning and programs. Traveler benefits and costs used to investigate and forecast trip and modal-choice decisions must consider perceived costs and anticipated incomes of relatively homogeneous population segments, such as older teenagers, rather than average costs and past incomes for heterogeneous population groups or households. Travel cost estimates of engineers and economists seem to be higher than those of teenagers. Incomes for teenagers and their desire to work to pay for high-quality private transportation seem to be underestimated by planners. The study discussed in this paper suggests that teenagers want jobs and cars as means to other objectives such as avoiding boredom, socializing, and obtaining goods and services. Active teenagers appear willing to spend as much as 50 percent of their budgets on transportation that satisfies their complex requirements for off-peak, unchaperoned dating and social and part-time employment trips. Policymakers should consider that many teenagers' perceptions of car ownership and use benefits far outweigh their perceptions of car costs; no evidence suggests that increased public education programs dealing with true car costs or the provision of inexpensive transit service are likely to significantly affect the modal preferences and travel behavior of older, working-class male teenagers. Public policies that reflect the economic behavioral preferences of these teenagers (and probably many other transit-dependent travel subgroups as well) would promote job-development activities and programs to reduce costs of car ownership and use.


- THE failure of past transportation planning to solve congestion and other problems associated with urban transportation has generated increased interest in 2 relatively unexplored planning approaches. Planners are investigating several economic policies, such as road pricing and rationing, to improve the efficiency or performance of existing systems. Planners also feel that their past behavioral assumption of population homogeneity might be inappropriate in many forecasting applications. Planners now encourage disaggregate research to describe, explain, and predict travel and expenditure behavior after assuming population heterogeneity. These 2 approaches should be coordinated. The application of economic policies should reflect subgroup resources and behavior to ensure that public programs will achieve their objectives and avoid negative impacts (10).

This paper will discuss some of the findings of one of the few studies on the economic aspects of travel patterns and problems as perceived and explained by relatively homo-

[^0]geneous population segments. The study ( 5,6 ) was conducted to anticipate the likely responses of suburban teenagers to improvē public transportation. Research methods included information gathered from adults knowledgeable about teenagers and adult economic behavior ( $1,2,3,4,7,8,9,10,12,13,14,15,16$ ), informal interviews with teenagers, observations of actual behavio $\bar{r}, \bar{a} \bar{d}$ structured interviews and surveys of panels of 50 male high school students who met weekly for 3 months. Panelists came from 3 Boston working-class suburbs and had varying degrees of access to automobiles and transit. Although particular statistics and observations in this paper cannot technically be generalized beyond the population involved in the research, I suggest that further empirical documentation of other population segments (especially the so-called transit-dependent youth, poor, elderly, and handicapped) will reveal many observations that also conflict with economists' assumptions of population homogeneity and behavioral simplifications.

The wide range of historically neglected topics related to the economic behavior of traveler subgroups cannot be detailed here. Most of the topics are discussed in the final report of the study (5). The topics (as perceived by subgroup members and social scientists) related to the economics of travel to be investigated for homogeneous population subgroups are as follows:

## 1. Topics

a. Traveler characteristics (demographic, transport availability, attitude)
b. Income sources and levels (cash and noncash, legal and illegal)
c. Expenditure items, levels, and priorities (money and time investments)
d. Travel behavior aspects, frequencies, and priorities (trip levels, distances, destinations, modes, purposes, timing)
e. Decision-making behavior (types, frequencies, priorities)
2. Static interrelationships, dynamics, and comparisons
a. Interrelationships among topics
b. Changes in topics over time (by day of week; from week to week; by season; and by physiological, chronological, and social age)
c. Comparisons of topics among similar and contrasting population segments (domestic and foreign)
d. Comparisons of people's characteristics based on behavioral similarities
3. Subgroup causal analyses and predictions
a. Causal explanations of information in parts 1 and 2 (with an emphasis on economic, sociological, and psychological factors)
b. Identification of policy-sensitive causal factors affecting behavior (including empirical examples and documentation)
c. Planning implications of policy insensitivity of factors affecting behavior
d. Forecasts of future behavior (with explicit behavioral and attitudinal assumptions for each subgroup)

The final report (5) also covers data collection methods that emphasize data accuracy and unique problems or error sources in subgroup data analysis. Other reports on these topics are available elsewhere ( $2, \underline{3}, \underline{7}, \underline{8}, 9$ ). The following section summarizes some of the observations related to the economics of subgroup automobile ownership and use.

## PANELISTS' TRAVEL ECONOMICS

For those in the study sample, half of whom were employed part time, weekly cash expenditures averaged about $\$ 25$. Cash outlays for travel by car, transit, and other modes ave raged about $\$ 5.70$, or roughly 20.5 percent of their expenditures. Noncash transportation gifts, such as gasoline paid by friends or transit fare reductions, were estimated at about $\$ 1.20 /$ week. The absolute level of a traveler's expenditures appeared to be associated with his daily trip distance [as predicted by Oi and Shuldiner (9)]; the percentage of a traveler's budget spent on travel appeared to be associated with his daily trip-gene ration rate. Teenagers in all 3 study towns spent the same proportion of their budgets on travel, regardless of transit availability, although residents of the
town with the best transit service spent a lower absolute amount on travel and had lower incomes. Eleven car owners reported weekly transportation expenses averaging $\$ 15.40$, or about 47 percent of their budgets; 15 family car users had weekly expenses closer to $\$ 5$, or 16 percent of their budgets; and 24 nondrivers spent only $\$ 2$, or 10 percent of their budgets on travel. Annual car costs estimated by owners came to approximately $\$ 770$ based on extrapolated budget data. The average perceived value of teenagers' cars was $\$ 487$ for cars averaging 7 years of age. [Comparative automobile expense data are available elsewhere (4, $\underline{8}, \underline{9}, \underline{10}, \underline{14})]$.

## EXPLANATIONS OF TRANSPORT EXPENDITURES

Understanding teenagers' decisions to buy, operate, and ride in automobiles requires understanding of their motives to acquire cars and their perceptions of fixed and variable car costs. The research done in the study suggests that these decisions may be quite reasonable and rational (that is, expenditures are made that are expected to achieve desired objectives).

Panelists offered 12 reasons why automobile trip costs were not major determinants in their car-acquisition or modal-choice decisions.

1. Maturing working-class travelers often feel compelled to secure their own transportation, even at high personal expense, because their parents and communities seem unwilling to provide transportation that permits informal, off-peak, and unchaperoned travel for highly desired and complex adolescent trip purposes such as dating or going to weekend jobs. Bus and rail transit, dial-a-bus, and other forms of public transportation appear to be unable to accommodate youth needs for short-range, fast, and spontaneous trip making. Automobiles, in contrast, satisfy teenagers' travel requirements and many other social and psychological needs as well. Car access permits teenagers to provide transportation and favors for their friends, gives private shelter for informal recreation, serves as a hobby outlet, and confers status, recognition, and feelings of self-worth on some teenagers who lack academic, athletic, or other skills and attributes that high school students value (4, 5, 6, 7, $9,12,16$ ).
2. Teenager car investments are motivated more by expectations than by experience. Mid adolescence is a transitional development period when social relationships, activities, and purchases change unpredictably. Teenagers expect conditions of uncertainty, and want predictable, flexible transportation to enable them to take advantage of new opportunities or to escape from boring or stressful situations. They are optimistic about the benefits they associate with cars and are seldom educated by parents or school about car costs.
3. Fixed costs for cars are often held to a minimum by teenagers. With the exception of teenagers who are strongly motivated to buy a very expensive new car or who receive a car as a parental gift, many teenagers appear to choose the cheapest small or used cars that can satisfy their transportation and other needs. Teenaged car owners reported lowering their investment costs by (a) arranging informal, interest-free car loans from their families, relatives, and friends; (b) not investing much money in safety and pollution-control devices, outward appearances, or broad insurance coverage that included fire and theft; (c) registering cars in a state or locality where taxes or fees were lowest; (d) obtaining cheaper insurance by taking driver education classes, registering cars in a parent's name, and sharing insurance costs with parents; and (e) avoiding parking storage costs by parking on neighborhood streets or driveways, not in garages or paid parking lots.
4. Maintenance and repair costs are kept to a minimum by many working-class male adolescents. Some repairs and maintenance such as tire maintenance and oil changes are done without professional assistance to save labor costs $(\underline{9}, \underline{13})$. When assistance is needed, teenagers sometimes attempt to do favors or barter with car hobbyists or young garage mechanics. Teenagers sometimes economize by not maintaining transmissions, brakes, lights, tires, or exhaust systems to the standards recommended by manufacturers or required by law. They also operate vehicles without
fixing broken side windows, trunk locks, or other car features that are not directly related to driving. Essential repair costs were held to a minimum by replacing broken or worn-out parts with used, rebuilt, or stolen parts.
5. Variable automobile travel costs are seldom considered after car access has been achieved to accomplish teenagers' most critical or complex trip purposes. Trip decisions seldom involved variable costs except for teenagers' occasional nonmetropolitan, long-distance, or special event dating trips involving expensive downtown activities. Ironically, transit and other nonautomobile modes were not perceived to be realistic alternatives to cars for these trips.
6. When teenaged car drivers are active travelers, their high trip frequency rates result in their perceptions of low average costs per trip. Within the study sample, car owners averaged about 7 car trips/day and car borrowers averaged about 6 car trips/ day. Some induced travel may have been generated by the panelists to lower average costs, but, generally, decisions to obtain car access already reflected behavioral expectations or hopes requiring intensive car use.
7. Gasoline, parking fees, tolls, and other variable costs are often quite low for teenagers in moderate- and low-density areas. Panelists' short car trip distances, which averaged 3.5 miles ( 5.6 km ) for drivers and 4.4 miles ( 7 km ) for passengers, resulted in low tire wear and gas consumption per trip. Parking at teenagers' suburban destinations was free. Tolls were relatively uncommon or avoided by use of toll-free alternative routes. Perceived variable costs are even lower than actual variable costs. Gas purchases may not be needed on short, local trips and parents may pay for many operating costs of borrowed cars used by teenagers. Obtaining gasoline also becomes almost an unconscious, habitualized activity for many drivers. (Trips to gasoline stations are practically never reported in travel diaries.)
8. Car passengers can travel at little or no additional cost to the driver; therefore, ride-sharing lowers travel costs per car occupant. Car drivers in the study sample made 62 percent of their car trips with at least 1 passenger. Panelists who traveled as car passengers reported an average of 2.4 companions/car trip.
9. Shared car rides offer the possibility of shared transportation costs and lower travel costs to drivers. Cost sharing is most common among teenagers on their complex or long-distance social-recreation trips that involve large outlays for gas and oil. When these costs are shared among several passengers, transportation costs per person are often less than costs for comparable public transportation or they are less than the driver was going to pay for his trip if he traveled alone. The possibility that drivers might provide a car ride for free seems to bias teenagers' modal-choice decisions away from transit, which has a required fare. Drivers can also receive concert tickets, liquor, special favors, or other goods and services from passengers that they might not be able to obtain if they could not provide transportation. Passengers perceive psychological and social benefits from paying their peers for car rides. They receive high-quality transportation that is free from the stresses of using transit. Cash or noncash payments for car rides with friendly drivers are viewed much more positively by working-class male teenagers than similar or lesser payments for impersonal transit rides.
10. High school students need to work only 10 to 20 hours/week to afford cars of their own; longer hours can produce sufficient income for many consumer purchases and higher automobile investments. Teenagers have important noneconomic reasons for working-to develop work skills, make social contacts, get exercise, relieve boredom, escape family and household pressures, and have some income that can be freely spent without parental controls. These reasons lead to desires to work considerably longer hours and to earn more money than would be needed merely for car ownership and maintenance. Notice that many of the social and psychological reasons for working also resemble those for driving and car ownership, which suggests that maturation, socialization, and family relationships are underlying causal factors associated with both teenager travel and work behavior.
11. The absence of nondiscretionary weekly budget expenditures for teenagers permits them to shift their expenses to automobile expenses in situations when car expenses increase (12, 16). Unlike adults, most teenagers are underemployed and have (or can
make) time for additional work hours. Panelists seemed to favor expanded job opportunities to earn money for good, but expensive, transportation more than they seemed to favor cost-reduction programs providing low-quality transportation service.
12. No indications were found that reductions in transit fares (absolute or relative to car cost increases) would increase long-term transit ridership among car users and those without car access. Car use remained relatively high in study towns that already had 20 -cent transit fares. Of the 7 panelists who claimed that they would eliminate transit expenses if their incomes were cut, 5 were nondrivers. Low-cost or free transit fares (for school trips) attracted pedestrians; transit fare savings were seldom sufficient to divert car users. During and after recent gas price increases, teenaged car users did not switch to transit in large numbers (12,16). In sum, the cross elasticity of travel demand by car and transit by older teenagers appears to be very low for most vehicle trips.

## SUMMARY AND CONCLUSIONS

Research on a sample of a population subgroup, male teenagers, revealed economic behavior patterns and explanations for behavior that differ from the information reported for overall populations by aggregate statistics and economic theory. Automobile trip costs did not appear to determine most trip or modal-choice decisions. Teenagers perceived automobile costs in marginal terms. These marginal costs are often quite low after car access is obtained and if cars are used for short, off-peak suburban travel with passengers. Perceived marginal costs are even lower than actual costs. Although car expenses are not insignificant, teenagers in many cases need only work 10 to 20 hours/week to afford cars of their own and seem to value work for many other economic and social reasons anyway. Finally, those in the study sample appeared to value highquality automobile transportation, to consider automobile expenses among their most important expenses, and to favor more job opportunities rather than programs to reduce transit costs. Mobility improvement programs that reflect these economic findings would promote job development activities and programs to reduce automobilerelated costs.

Disaggregate descriptions of expense, travel, and decision behavior need to be obtained for relatively homogeneous population subgroups. This information would help planners understand the basic causes of subgroup behavior, identify how public policy can influence the causes of behavior, forecast future subgroup behavior, and anticipate the economic, social, and psychological impacts of public policy.

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[^0]:    *Mr. Gurin was a PhD student at Harvard University when this research was performed.

