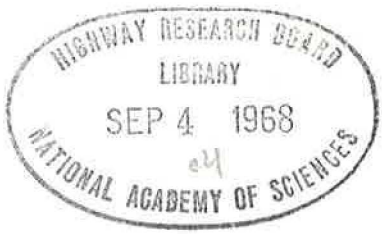
HIGHWAY RESEARCH RECORD

Number 233

Public Attitudes Toward Highway Improvements

4 Reports



Subject Area

15 Transportation Economics
82 Urban Community Values

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Foreword

In light of recent public resistance to proposed urban highway improvements there is a growing realization that the transportation planning processes must take into account public attitude in location and design of highway improvements. Four papers are presented in this RECORD dealing with different aspects of public opinion towards highway improvements and aesthetics.

Thiel and Yasnowsky deal with techniques for evaluating the effects of highway beautification programs. The authors review the Highway Beautification Act and discuss the methods used to evaluate effects of the act on outdoor advertising in highway oriented businesses. They discuss some of the effects on junkyards, which will need to be relocated or screened; highway-oriented businesses, which will lose use of billboards for advertising; and outdoor advertising companies, which may experience losses during the time of readjustment. The act foresees scenic enhancement to be realized in aesthetic pleasure by motorists and increases in property value to benefit landowners.

Goodwin studies shopper attitudes in small cities and compares them to those in larger cities. Parking was considered to be the most important disadvantage of CBD's in both large and small cities. Shoppers were shown to be oriented toward an area by virtue of attitude and buying behavior. There was substantial shopper mobility in the small cities.

One of the effects of the Highway Beautification Act would be the reduction in billboards and other information sources for travelers desiring highway services. Moore, Mayer, and Mason report on research done in attempting to put a value upon the limitations of sources of information on motels and hotels. They found that physical appearance of lodging was the most important source of information and that billboards ranked second. When two or more sources of information were used by motorists, billboards dropped to sixth position. The advice of individuals, referral services and reservation services outranked all media-oriented information services.

Nash and Hille summarize attitudinal research conducted over the past three years in identifying variables in modal choice decisions in the Baltimore and Philadelphia metropolitan areas and the degree of satisfaction with public and private modes. The study found a distinct preference for private vehicles although there was substantial variability.

Contents

Some Effects of Highway Beautification

FLOYD THIEL and JOHN YASNOWSKY, U. S. Department of Transportation, Federal Highway Administration, Bureau of Public Roads

Carrying out the Congressional request for an economic impact study of the Highway Beautification Act has resulted in an overall analysis of the effects of the Act based largely on 25 studies in various states. The impact of the Act was estimated using study and control area comparisons, before and after period comparisons, industry trend analysis, attitude surveys, case studies, a county input-output model, and by analogizing from known experience.

The overall impact of the Act should be fairly minor, though certain groups will experience a more pronounced effect. Outdoor advertising companies may experience some losses during the time of adjustment to the Act. Motorists will experience increased pleasure, comfort, convenience, and safety; very few motorists will experience problems in locating highway services. Highway-oriented businesses will in some cases lose trade and in others gain, since billboard controls should have little effect on total demand for gas, food, and lodging. Some landowners will experience land value increases (e.g., from sign or junkyard removal nearby), though some sign site owners will lose rental income. The effects of junkyard control will be felt primarily by owners of junkyards which need to be relocated; screening will have little effect, though some benefits may accrue to screened junkyards and property nearby. Scenic enhancement effects will be felt by motorists—in the form of increased driving pleasure—and by landowners who will realize some increases in property values near scenically enhanced highways.

•PUBLIC programs that are beneficial to society in general often have varying effects on individuals and groups within the society. The Highway Beautification Act of 1965 is such a program. The Act calls for the control of outdoor advertising and junkyards along the Federal-Aid Primary Highway System and provides for landscaping and rest and recreation areas along both the primary and secondary highway systems.

In passing the Highway Beautification Act of 1965, the Congress obviously felt that the benefits would outweigh the costs. However, the Congress also recognized the need for further study of both the beneficial and adverse effects of the highway beautification program and requested a "... comprehensive study of the economic impact ... on affected individuals and commercial and industrial enterprises ... and the public and private benefits realized thereby ...."

In order to carry out this Congressional mandate, 25 economic-impact studies were conducted in various states throughout the country. These are listed at the end of this paper. Findings from these studies were summarized by the Bureau of Public Roads in a staff report, "Economic Impact of the Highway Beautification Act," and a condensed version of this report was submitted to the Congress in early 1967. This paper describes

Paper sponsored by Committee on Socio-Economic Aspects of Highways and presented at the 47th Annual Meeting.

some of the methods and findings from the studies and from the Bureau's summary and analysis. The findings presented in this paper are generally predictive in nature. More precise estimates of the economic impact of the Act cannot be made until it has been in existence for some time and actual experience becomes available.

STUDY METHODS

Evaluating the effects of the Highway Beautification Act required: (a) a determination of the types of individuals and groups affected, (b) an estimate of the nature of the effects, (c) development of a method for measuring those effects which could be quantified, and (d) the determination of a time period over which these effects would be considered.

Individuals and groups affected by the provisions of the Highway Beautification Act were determined primarily by reviewing the legislative hearings on the Act. Outdoor advertising companies, roadside businesses, motorists, landowners, and junkyard operators are among those expected to be affected most, e.g., by a gain or loss of income, increased driving pleasure, and change in land values. Estimating the impact involved analysis of past experience and the opinions and attitudes of the affected groups. Most of the studies were conducted on a local or statewide basis; a survey of the "standardized" outdoor advertising industry conducted by Memphis State University and Texas A&M University was done on a national scale.

The inventory of signs and junkyards on Federal-Aid Primary Highways and the estimate of the costs of complying with the Act—both accomplished by the state highway departments and the Bureau—also provided basic data for the estimate of economic impact. For example, the sign inventory provided useful information for an analysis of sign ownership and types of advertisers using outdoor advertising. A finding from this analysis is that only about one-fourth to one-third of all signs advertise goods and services which are needed by motorists (e.g., motels, restaurants, and service stations).

The time period over which economic impact estimates would be made had to be considered in analyzing the effect of the Act; that is, whether the estimates would be for the short run or for a longer period of time. At least one study (at West Virginia University) provided estimates of the impact on the outdoor advertising industry for both the short and the long run, though most studies considered the short run.

Another consideration was whether or not the research should take the form of a benefit-cost analysis which would provide an evaluation of the economic impact of the Act on an aggregate basis or a study of the impact on affected individuals and groups. The second approach was followed, primarily because Congress was apparently concerned with the impact on all individuals and groups which might be affected by the provisions of the Act, even though net benefits overall were expected to exceed costs of the program. Therefore, although most of the researchers were aware that the aggregate impact of the Highway Beautification Act on the national economy would be negligible, they considered it important to determine the redistribution effects on individuals and groups which would be affected.

The methodology used in the research included several of the techniques common to economic impact studies: "study and control" area comparisons, before and after comparisons, trend analysis of an affected industry, attitude sampling and analysis (including some fairly meticulous procedures to assure unbiased results) case studies, and a county input-output model which was developed at Pennsylvania State University. Study and control area comparisons included sections of highways with and without billboard control to determine what response motorists have to this difference and whether the absence of billboards causes any problems for motorists seeking highway service.

Some of the study methods have been adapted from analyses of other public projects, particularly from evaluations of water resources or other recreational facilities. There are some obvious similarities in the problem of evaluating effects from scenically enhanced highways and the effects of parks or open space. Such recreational benefits as those accruing to observers traveling past a park resemble the effects experienced by travelers on scenically enhanced highways. No really satisfactory method has been devised for evaluating cultural or aesthetic benefits, and monetary or economic values

provide only a rough and inexact measurement. Because of the problem of measuring intangible benefits, costs are described in terms that permit a fairly direct comparison with the benefits received.

FINDINGS

The economic impact of the Highway Beautification Act should be fairly minor, at least on a national basis. The impact on certain affected groups will be more pronounced and can be described in terms of the provisions for outdoor advertising control, junkyard control, and scenic enhancement. There are, in addition, effects not directly related to the three main provisions of the Act which are here referred to as overall effects.

Effects of Outdoor Advertising Control

The outdoor advertising provisions of the Highway Beautification Act affect several different groups. Those most directly affected are (a) outdoor advertising companies, (b) highway-oriented businesses, (c) motorists, and (d) sign site owners. The official information centers and right-of-way signs provided for in the Act should result in substantial benefits to both motorists while adequately serving the advertising needs of roadside businesses.

Outdoor Advertising Companies—The Act will affect the outdoor advertising industry by removing many of the signs presently being operated and by reducing future sign opportunities. This loss of signs could in turn have a detrimental effect on outdoor advertising company income, employment, and capital investment, at least in the short run.

There are several possible adjustments which could be made by the industry, such as sign relocation in permitted areas or erection of more profitable types of signs, such as painted bulletins. In fact, outdoor advertising companies may experience some measurable benefits which will offset some of their losses from sign control. The industry ecognizes that a heavy concentration of signs reduces the value of each individual sign, and that fewer signs per mile increases the profit-making ability of each sign.

Roadside Business Establishments—There are currently more than a half million establishments engaged in what can be called a highway-oriented business industry (e.g., in providing gas, food, lodging, and similar goods and services). Many of these establishments make extensive use of outdoor advertising for attracting and informing customers.

To the highway-oriented business industry as a whole, the Act will probably be beneficial, since it should make highways more conducive to pleasure and vacation travel. However, some establishments will undoubtedly experience losses due to a redistribution of business, for example, away from those which previously relied on outdoor advertising to those which did not use this medium. Although there has been some concern that outdoor advertising controls will cause the small establishments to lose business and large ones to gain, this effect is not at all certain. The study conducted by the California Division of Highways indicated that small motels (8 to 18 units) did not use billboard advertising to as great an extent as larger motels (42 units and more). Therefore, with fewer billboards, these small motels in California may realize increased returns.

Managers and owners of highway-oriented business establishments vary considerably in their estimates of the effectiveness of outdoor advertising. Some owners and managers feel that other means of attracting customers are more effective (e.g., guidebooks).

Roadside business establishments can expect benefits from outdoor advertising control when this reduces advertising costs that result when establishments advertise only because their competitors do. A study by New Mexico State University, for example, found that several motel managers would be willing to remove their off-premise signs in order to save the amount spent on outdoor advertising provided their competitors did likewise.

Motorists—Surveys from several studies revealed that a majority of motorists were more interested in billboards advertising highway services than billboards advertising

other products. Motorists indicated they preferred or would be satisfied with official signs advertising highway services, but most motorists wanted specific brand names on official signs. Without billboards, motorists would turn to guidebooks or use personal inquiry to locate facilities.

Surveys show a wide range in the percentage of motorists using billboards for selecting highway services. For example, a University of Missouri research team asked 726 motorists why they selected the motel or restaurant of their choice. The responses showed the following:

Knew of the motel before	37 percent
Got tired at that point	13 percent
Liked the appearance	13 percent
Selected it on basis of outdoor advertising	10 percent
Liked the convenient location	9 percent
Selected it on basis of friend's recommendation	7 percent
Gave miscellaneous reasons	11 percent

This study also indicated that infrequent travelers were most dependent upon roadside advertising signs, whereas those who traveled most frequently were most strongly opposed to them.

A New Mexico State University study found that of 600 vacationing motorists interviewed the following reasons were given for selecting the motel of their choice:

Chain or association	30 percent
General appearance and attractiveness	18 percent
Repeat visit	17 percent
Credit cards	10 percent
Highway billboards	6 percent
National advertising	5 percent
Miscellaneous other	14 percent

Landowners—Some landowners will experience losses of income earned from the rental of sign sites. However, the removal of signs in many cases will allow the site to be used for other types of development which may serve to offset the loss of income resulting from removing signs. Also, some landowners in commercial and industrial areas where signs are permitted may find that their land is more valuable as a sign site and may receive an increase in rental income. This will result from the decreased supply of land for signs and the probability that this scarcity of land will result in signs of a higher quality in order to increase their effectiveness. With only a limited number of signs permitted, it would be uneconomical for an outdoor advertising company to maintain unsightly and ineffective signs. An indirect effect of the improvement in billboard quality will be to increase income to some landowners.

Official Information Centers and Right-of-Way Signs

The writers of the Highway Beautification Act of 1965 were fully cognizant of motorists' needs for information and provided for the erection of information centers and official right-of-way signs. Such centers will be beneficial to motorists, roadside businesses, local communities and even to outdoor advertising companies. Experience with information centers that have already been built with both private and public funds has been encouraging. Figure 1 provides an example of such an information center.

For a tourist-oriented business, information centers have several advantages over off-premise commercial signs. First, they are more effective in providing complete information for the traveler. The information center enables the businessman to "tell his full story" about the facilities he has to offer, rates, and even vacancies in some cases. Second, the cost of advertising is substantially less. For example, it costs $12 initially plus $24 per year for an advertiser to place a sign at the information center in Aspen, Colorado (Fig. 1). Costs for advertising using off-premise signs are generally

Figure 1. Information center, Aspen, Colorado.

higher than this. Third, the advertiser does not risk losing those customers who may be opposed to signs along a highway.

In addition to information centers, official signs on the right-of-way of Interstate highways may provide the tourist-oriented business with an opportunity to communicate with the motorist. A demonstration project conducted along I-95 in Virginia shows how such signs will benefit roadside businesses. Of 578 motorists interviewed who had used the signs, 97 percent of the gasoline customers, 89 percent of the food customers, and 93 percent of the lodging customers indicated that the signs met their needs. To test the effectiveness of the signs, the researchers observed gasoline sales with the signs exposed and with the signs covered. In almost all cases, daily sales by the stations listed on the information signs were higher when the signs were exposed than when they were covered. Figure 2 shows one of these signs.

Official information centers and right-of-way signs can provide alternative sources of income for outdoor advertising companies who will lose signs under outdoor advertising control. The manufacture, erection, and maintenance of signs and other materials at information centers, for example, can probably be accomplished best by the skills and business experience of established outdoor advertising companies. Several outdoor advertising companies have shown an interest or are already engaged in providing advertising services of this type. For example, an outdoor advertising company has recently erected a building in Iowa to provide the types of information needed by the traveler, including points of interest and health, emergency, and personal services (Fig. 3). Information of this type cannot be readily obtained from off-premise billboards as they now exist. The effectiveness of this information center has been studied in Iowa by Arthur D. Little, Inc., in cooperation with the Iowa State Highway Commission.

The uncertainty that exists in the outdoor advertising industry provides another reason why investment in information centers or right-of-way signs would be advantageous. This method of advertising seems to be well accepted by advertisers, local communities, and the traveling public. This has not been the case with off-premise signs and billboards. For many years, local and state governments have been enacting legislation to

Figure 2. Official right-of-way sign on I-95 in Virginia.

eliminate off-premise signs. Many garden clubs and other groups are opposed to this type of advertising and advertisers have been aware of this public reaction. By investing in a product which is desired and needed by the traveling public (i.e., information centers), the industry could find itself in a more stable environment.

Effects of Junkyard Control

There are over 20,000 junkyards of all types on Interstate and other primary highways, according to the inventory of signs and junkyards. A majority of these junkyards

Figure 3. Information center erected by an outdoor advertising company in Iowa.

will need to be screened or removed to comply with the provisions of the Highway Beautification Act. Several economic impact studies sought to learn the attitudes and opinions of junkyard operators as to the possible impact of the Act on their businesses.

Studies at Pennsylvania State University and Texas A&M University indicate that the effects of screening junkyards would be relatively minimal. In fact, the Pennsylvania State study found that several of the larger junkyard operators were generally in favor of the Highway Beautification Act because they felt that screening would result in better public relations.

Although junkyard operators anticipated few adverse effects from screening, they were more concerned about moving to another location. For example, nearly half of the automobile wreckers surveyed by Texas A&M University expected removal to another location to result in decreased sales. The automobile wreckers also anticipated a decrease in employment if forced to move. However, of eight automobile wreckers who had actual moving experience within the past five years, seven stated the move had little effect on sales. Because many junkyards are not full-time operations, the survival rate for the 3,500 junkyards that need to be removed may be as low as 35 percent.

Junkyard control provisions are expected to result in the general enhancement of property values and, therefore, tax rolls. Several qualified analysts believe screening will improve neighborhoods and land values near these screened yards. Relocated junkyards result in tax gains for some jurisdictions and losses for others. For example, a tax loss may result from a relocated junkyard unable to survive a move. However, the new uses appearing at the sites vacated by junkyards may be higher income producing uses and may yield more taxes than junkyard operations.

Effects of Scenic Enhancement

Scenic highways result in benefits to at least two groups: highway users and nearby landowners. Aesthetic landscape design typically enhances the motorists' safety and enjoyment and stabilizes community desirability and property values. Roadside beautification is really just another way of striving for the "complete highway," a highway incorporating aesthetic factors of the highway and the abutting landscape corridor so as to contribute to highway safety, economy, utility, and to the aesthetic character of the corridor itself. When combined with rigorous engineering standards, highway beautification makes pleasure driving more enjoyable, but does not impair the highway's usefulness for commercial or other types of traffic.

Highway User Effects—Surveys of motorists' desires show that scenic or beautiful highways are preferred by nearly all highway users. Some motorists have such a strong preference for scenic routes that they will travel farther or longer in order to traverse a scenic highway.

In one survey, scenery was rated as more important than travel time and distance but less important than congestion. Scenery was rated highest for pleasure driving with no particular destination and for driving to vacation destinations. Apparently the more time a motorist has to spend on his trip, the more he is likely to select a scenic route (1).

Land Values—The pleasure which scenic highways or parkways are meant to generate is reflected at least in a general way in the development and the value of land near these facilities. Land values provide a fairly objective measure of the economic potential of a piece of property or of an area. Land values tend to be more objective than some indicators (e.g., opinion surveys) because land values avoid most problems of interpreting the real attitudes of respondents. Land values are based on verifiable contracts rather than statements or responses which may sometimes be self-serving or otherwise inaccurate.

Land values can be an indicator of "all the various direct and indirect impacts" (2). They ordinarily reflect changes affecting property, whether the influence is a school, a park, a parkway, or scenic highway or an adverse influence such as a noisy, dangerous traffic arterial or the presence of air pollution. While many of the effects may have been merely attracted rather than created by the parkway or other project, there is considerable agreement that well-conceived and well-located projects may be associated with land value gains (due to increased economies and efficiencies) that will not be offset by losses elsewhere (3).

While improved aesthetics or visual quality appears to be the primary purpose of scenic highways these facilities can result in economic benefits as well. This generalization can be made on the basis of analogous experience with parks and open space, on the strong preference which prudent real-estate investors have for pleasant surroundings, and on the persistent economic well-being which has been associated with parkways.

Parks, Open Space, and Parkways—There is general recognition of the beneficial influence of parks and open space on nearby areas. At least some of the benefits of parks and open space accrue to nonparticipants, to people passing by the parks, or to residents living near the park who may never make any direct use of the park. This park effect typically shows up in increased land values nearby. In Washington, D.C., parks have been credited with enhancing nearby property values to such an extent that the resulting increases in property taxes have far exceeded maintenance and operating costs of these parks (4).

Private developers make good use of the tendency which open space, parks, or park-like highways have for enhancing values of nearby land. In Los Angeles, where the Hollywood and Santa Ana freeways were constructed through areas covered by old buildings which had to be removed, plantings so improved the general tone of the neighborhoods that owners have been stimulated to renovate, reconstruct, and develop their properties (5). Many developers find that the income foregone by keeping certain areas untouched is more than recovered by the higher prices received for those properties which sell (6).

Experience Near Parkways—Parkways or scenic highways have some of the characteristics of parks and some of the characteristics of highways. A recent study in the Washington, D.C., area provides a comparison of land values near parkways and other highways. Although some of the growth near the Baltimore-Washington Parkway may result from such nonroad influences as greater economic development in the direction of Baltimore, the use of the so-called participation ratio generally adjusts for these; at least for those nonhighway influences which were present at the beginning of the study period in 1950 (7).

From 1950 to 1961, parkways generally outpaced nonparkways, both in land value changes adjusted for general price changes and in the share of Washington's development accounted for in areas near the parkways and the nonparkways. For example, the corridors along the George Washington Memorial Parkway experienced a 300 percent gain in average land values between 1950 and 1961, whereas the average increase in land value along Shirley Highway (a nonparkway) during the same time period was about 80 percent.

A comprehensive study of parkways and land values completed a number of years ago showed that parkways in the vicinity of New York, Boston, and Kansas City were economically sound. Land values in areas affected, taken to be "the measure of (the real-estate's) possible benefits to the available purchaser who can make the most profitable use of it," increased dramatically (8).

Experience Near Other Scenic Highways—An attitude survey in Chicago indicates how nearby residents feel about some of the newer highways where attention has been given to making these highways aesthetically pleasing. In response to the somewhat leading question, "Do you consider the expressway a thing of beauty?" the responses were "yes" from 70 percent along the Eden Expressway, 100 percent along the Kennedy Expressway, and 80 percent along the Eisenhower Expressway. Open cut areas of greenery were generally preferred over close neighbors, and the Eisenhower Expressway was considered a factor in revitalizing the slum area nearby. Some residents regarded the expressway as their park, to be enjoyed visually even though they did not physically enter the area (9).

Local Tax Base Effects—Scenic enhancement provisions should generally be beneficial to local tax bases, though some adverse effect may be experienced by local taxing jurisdictions where scenic easements retard development. Such restrictions to development may occasionally divert development to other taxing jurisdictions but ordinarily will only cause the development to be removed further from the highway. Some adverse effect may also result due to the removal of property from tax rolls because of acquisition of additional land for scenic strips. Both of these possible adverse effects should

be minor and more than offset by general enhancement of tax rolls because of the Act, but no concrete evidence of this is now available.

Maintenance Benefits—Good landscaping often eases maintenance problems and costs. In Ohio, "expenditures for roadside development, flattening and rounding slopes, seeding, landscaping, and erosion control have provided handsome returns in reduced maintenance expenses ..." (10). Maintenance savings typically result from using plantings that are functional, for example, that save mowing, reduce headlight glare, hide litter, abate noise, guide drivers, screen undesirable views, and serve as snow fences. Living snow fences have saved up to $500 per mile in maintenance costs (11).

It is obvious that some aspects of well-landscaped highways tend to raise as well as lower maintenance costs. Rest areas, for example, often create serious maintenance problems resulting from vandalism (12). At the same time, rest areas tend to lower costs for such important maintenance items as litter control. This is shown by the heavy use which is made of litter barrels at rest areas. Surveys of facilities used at rest areas and measures of litter collected at rest areas demonstrate how important it is to have these trash barrels easily accessible. For example, as many as 16 barrels of trash are collected each day from some rest areas.

While disposing of this volume is a major task, it is obviously much more economical to handle this rubbish when it is in barrels than to have it scattered along the roadsides. Even if the barrels are used for domestic garbage, it is still better to have the garbage there than in the ditch (13). Also, providing pleasant and neat roadsides with adequate rest areas equipped with trash receptacles should influence more motorists to help keep these landscaped highways neat by properly disposing of their litter.

Some Overall Effects

In addition to the effects on specific individuals and groups, there will be some overall or general effects resulting from the Highway Beautification Act. These effects include (a) an increased consciousness of the need for preserving the Nation's scenic resources, (b) the beneficial effect the highway beautification program will have on the national economy, and especially on local economies, and (c) the benefits resulting because of the permanence of most highway beautification measures. These overall effects, especially the relationship between costs and benefits, can also be perceived by considering costs on a unit basis.

Increased Interest in Scenic Resources—The current interest in the quality of the environment in the United States is unmistakable. "More and more people are concerned with water pollution, air pollution ... solid wastes, the preservation of areas for outdoor recreation and for open space, the design and arrangement of both the urban and rural landscape .... Living in harmony with nature has become a matter of conscious attention and national policy ..." (14). Clearly, "there are strong indications of an awakening public appreciation of the amenities and acceptance of responsibility for preservation of our vanishing resources, the Nation's landscape" (10).

The Highway Beautification Act of 1965 cannot properly be credited with creating the current interest in aesthetic highways or environmental quality in general, but the Act can be credited with intensifying this interest. The Act is focusing attention on what John T. Connor, former Secretary of Commerce, called "an often neglected aspect of highways." News stories have credited the highway beautification program with adding impetus to such developments as oil company efforts to design their service stations to blend with the scenery, and attempts to protect trees by barricades during construction. In July 1965, a writer in Landscape Architecture even associated an increase in subscriptions to that magazine with the beautification program.

Local Economy Effects—The economic stimulus which expenditures for highway beautification (e.g., landscaping and screening) provide is fairly obvious. While the effect on economic activity is generally less for highway expenditures than for other public expenditures where labor costs are more important, $1 spent for highway beautification will ordinarily result in total expenditures of more than $2 as estimated from a Pennsylvania State University input-output model.

Whether the expenditures for scenic enhancement and junkyard control will result in economic activity sufficient to offset the economic activity lost because of signboard removal is not entirely clear. If, as is anticipated, investment in landscaping or other comparable highway beautification projects encourages tourism, enhances land values, and eases driver tension, then the investment in highway beautification should result in economic gains greater than the losses following removal of some billboards.

Considerable insight as to whether gains resulting from investment in beautification will offset losses from removing billboards was provided by an input-output study of the economy of Clinton County, Pa. The input-output model has been used for several purposes, such as forecasting impact of highway construction and forecasting the effects of a strike at a local aircraft plant. The technique is considered fully operational for Clinton County.

The major finding from the study was that the county would experience a slight increase in economic activity as a result of the Act. In terms of relative change, the impact in Clinton County will be slight. Total economic activity for the county as a whole would increase very little—less than 0.1 percent. This would scarcely be felt in the economy, though there may be some dislocations evident due to the manner of income distribution within the community.

The burgeoning tourist industry has helped focus attention on the association between pleasant surroundings and economic progress. Increasingly, communities are emphasizing their pleasant scenery in an effort to attract tourists.

More and more, there appears to be agreement that cities need to "make a charming entrance" in order to "draw tourist dollars" (15).

The increased opportunities which scenic highways may offer for business activity are to some extent offset by losses in other areas. Highway beautification, whether along the highway or on private property bordering the highway may, therefore, not result in any substantial increase in revenue to the tourist industry on a national basis. However, to the extent that foreign travelers can be encouraged to travel in America or to the extent that Americans can be encouraged to travel more in this country than they would have traveled without scenic highways, this does represent a gain in revenue for the tourist industry.

The Permanence of Highway Beautification—The benefits which highways, especially limited-access highways, can yield as dividing lines or buffers between different land uses have been well established. Limited-access highways are especially effective for this purpose, apparently partly because of their permanence (their built-in resistance to obsolescence). Highway beautification enhances this feature of limited-access highways.

Highways do wear out over time or at least become inadequate for the required service. Even highway right-of-way must be regarded as having a definite life, though right-of-way does ordinarily have a longer life than surfaces or structures. Some benefits of highway beautification (e.g., well-landscaped open space) may extend beyond the economic life of the right-of-way, for example, beautification in areas where some benefits continue after highway abandonment.

While well-designed and well-located highways may have longer duration than the buildings or other manmade structures nearby (16), it is obviously possible to surround highways with an environment that will be long lasting.

The early parkways did this. In fact, the landscaping along some of these parkways has outlasted the roadway itself. This potential benefit of highway surroundings that protect the highway from undesirable encroachments has of course been recognized for some time. A 30-year-old report states that "Parkways will benefit future generations as well as the present. Parkways have great duration, though the surface may wear out several times" (8).

This permanence of highways with parklike surroundings apparently results primarily from the way in which time affects different elements of the highway and the highway environment. While pavement and buildings grow older and deteriorate over time, a landscape with a minimum of care regenerates itself by the process of nature (e.g., cycles of day and night and the seasons). This tendency for parklike landscaping along highways to continue to be aesthetically pleasing may even become more

pronounced in the future. Some of the current practices not only tend to simplify maintenance, but also foster this regenerative aspect of natural landscaping, e.g., no-mow ground covers, small plantings that may reseed themselves, and uneven rows or clumps of plantings so that replacements are not necessary (17, 18).

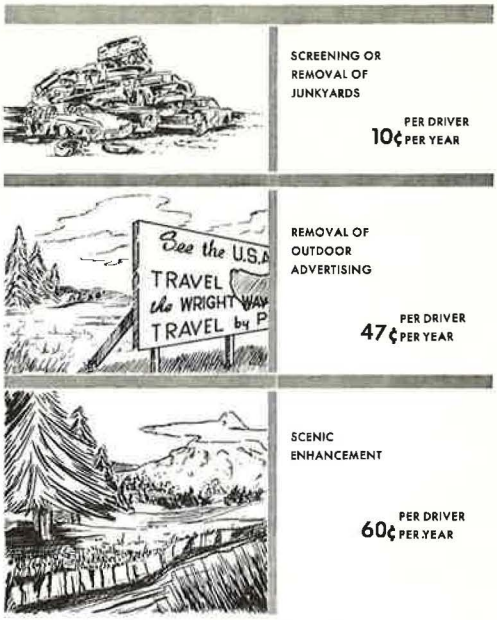

Figure 4. Highway beautification costs over a 20-yr period.

Benefits Perceived Through Unit Costs—As suggested previously, the benefits of such a program as highway beautification should exceed the costs. In the absence of precise information about benefits, costs can sometimes be described or restated in terms that permit decision-makers to compare benefits and costs in a meaningful way. For example, the costs of carrying out the provisions of the Highway Beautification Act were at one point estimated to be approximately $1.17 per driver per year with total costs amortized over a 20-yr period at 6 percent interest compounded annually and divided among 99 million drivers (Fig. 4). Costs should actually be somewhat less than those shown since these unit costs are derived from the relatively expensive program which was under consideration in early 1967, and since in the future there will be more than the present 99 million drivers to share these costs. Also unit costs would be substantially less if passengers as well as drivers were considered.

Rest Area Benefits—The benefits derived from rest areas are obviously substantial. Whether these benefits are as great as the cost must be considered. Under the highway beautification program, rest areas on the Interstate System will cost about $150,000 each. Based on incomplete information, it appears that the 2,500 rest areas along the Interstate System may attract somewhere between 5 and 14 percent of the traffic passing these facilities. If the percentage of vehicles stopping is as low as 5 percent, costs would amount to less than 5 cents per car for each visit assuming a 20-yr life for the rest areas.

Some insight may be gained concerning the value visitors place on these stops by considering the amount of time visitors spend at rest areas. Very incomplete data indicate that rest area visitors typically spend about 15 minutes at each stop. Motoring for pleasure has sometimes been valued at around 36 cents per person per hour, a figure derived generally from the vehicle operating cost divided among the people in each vehicle traveling for pleasure (19). The 36 cents per hour estimate may understate the value motorists place on pleasure driving, since it was based on a lower traffic speed (around 25 mph) than that now existing, and it assumes more people (i.e., four) in each car than the 3 or less which current state and Bureau studies show to be typical for pleasure travel.

Assuming that people traveling for pleasure do value this activity at about 36 cents per hour, it appears that they may be at least implicitly placing considerable value on rest area stops. For example, a pleasure traveler is apparently foregoing (or at least postponing) travel which he may value at around 9 cents each time he stops for 15 minutes.

Cost of Pleasure Driving—Consideration of the cost of pleasure driving provides some perception of the benefits yielded by highway beautification. Motor vehicle use studies have shown that at least 12 percent of the automobile travel in the United States is for pleasure driving. This means that approximately 90 billion vehicle-miles were traveled for pleasure in a recent year (taking 12 percent of the 750 billion vehicle-miles traveled on all highway systems in 1966, when traffic volumes were considerably lower

than at present). If each motorist is aware that his variable or operating costs are approximately 6 cents per mile traveled, it follows that motorists who traveled these 90 billion vehicle-miles for pleasure placed a value on this travel of at least $5 billion. At least out-of-pocket costs of over $5 billion were met in order to engage in this pleasure driving. It would be interesting to compare this yearly cost which motorists meet in order to drive for pleasure with the estimated yearly costs for beautifying the highways on which much of this pleasure driving takes place. A comparison between the $5 billion spent yearly for pleasure driving and the yearly costs for highway beautification obviously would not provide any indication as to whether the amount planned for highway beautification is appropriate or proper. But the magnitude of the cost of this pleasure driving does provide a good indication of the resources motorists are willing to commit to pleasure driving.

SUMMARY

The overall benefits of the highway beautification program are expected to exceed the costs. To learn more about this and to ascertain what impact the program may have on affected groups, the Congress requested a report of the program's costs and economic impact.

The economic impact report involved 25 studies conducted in various states. These beautification impact studies made use of several techniques used previously in economic impact analysis: study and control area comparisons; before and after period comparisons; industry trend analysis; attitude surveys; and case studies. Analysis of situations analogous to those expected after highway beautification becomes effective (e.g., absence of billboards, and presence of motorist information centers) has been helpful in estimating effects of highway beautification. Use of a county input-output model has also provided considerable insight on the impact of the program. Although these studies and the Bureau's summary study deal with estimates of future effects and with effects which are partly intangible, a few generalizations can be made.

1. The overall economic impact of the Highway Beautification Act should be fairly minor. There will be more pronounced effects on certain groups, including outdoor advertising companies, motorists, highway-oriented businesses, landowners, and junkyard operators.
2. State surveys have revealed that about one-third of the motorists contacted use billboards for selecting highway services. However, a majority of motorists indicate no difficulty in finding highway services where billboards have been restricted. Motorists are expected to realize substantial benefits in the form of increased pleasure, comfort, convenience, ease, and safety.
3. The total demand for food, gas, and lodging will not be influenced appreciably by billboard controls; the impact will tend to be a redistribution of sales among all highway-oriented businesses rather than a loss of sales.
4. Outdoor advertising controls may have the beneficial effect of reducing unnecessary advertising costs, for example, by roadside businesses now using outdoor advertising only because their competitors do.
5. Official information centers and right-of-way signs have been found to benefit motorists, roadside businesses and local communities. The need to provide advertising services at information centers offers significant economic opportunities for outdoor advertising companies.
6. Some landowners will experience land value increases with highway beautification (e.g., from sign or junkyard removal or scenic enhancement nearby). Some sign site owners will lose income from sign rentals.
7. The effects of junkyard control will be felt primarily by the owners of junkyards that will be relocated bacause screening is not feasible. For the 3,500 junkyards to be relocated or removed, many of which are not businesses or not full-time business, survival rates may be as low as 35 percent. Junkyard screening should have a generally beneficial effect.

8. Scenic enhancement effects will be felt by motorists and landowners, among others. Motorists clearly prefer scenic highways, though there is little or no evidence to show how much farther or longer motorists will travel to make use of a scenic highway. Land values have been found to increase near parkways more than near other highways of comparable design.

9. Some perspective may be gained by putting beautification costs in terms that can be easily understood and weighed against the benefits received, for example, over a 20-yr period. As an example, for rest areas along the Interstate, costs average 5 cents for each automobile visit at a rest area. There are indications that the value motrists place on a 15-min stop at a rest area may be about 9 cents.

10. The economic life of a highway can be prolonged by scenic enhancement. The enduring values associated with parkways, some of which are now several decades old, demonstrate the wisdom of surrounding highways with landscaping which will endure rather than man-made structures which may soon become obsolete.

The findings are obviously tentative, since they are estimates that will be affected by the beautification standards that come into being, by adjustments individuals and groups make to the beautification program, and by general economic conditions.

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Attitudes and Shopper Mobility in a Small City

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The decentralization of retail trade or shift in activity from the CBD to suburban areas has been a strong trend for the past two decades. Cities under 50,000 in population faced with the problem of decentralization are in a unique position. Different shopping trip patterns, greater dependence on the private automobile, and strong retail competition from metropolitan areas that are now more accessible due to new and improved highway systems make approaches to studying the decentralization problem somewhat different.

This study compared shopper attitudes in a small city to those in larger cities so that differences in attitudes peculiar to the size of the city could be found; shopper attitudes are generally held to be the key factors in determining preferences for shopping areas. Data published by the HRB in its 1955 project Parking in Relation to Business was used as a basis for comparing attitudes. This study was also concerned with habits, use of the small CBD, and shopper mobility to places away from the small city.

Parking was considered the most important disadvantage of the CBD in the small and in the larger cities, but inadequate parking in the larger CBD's was minimized or negated by the possession of more important advantages. Advantages of the small city CBD were not as decisive as those in the larger cities. In general, the advantages of the small city suburban areas were positive considerations rather than the negative factors of the CBD as they were in the larger cities.

Shoppers were classified on the basis of demographic characteristics and were shown to be oriented toward an area by virtue of their attitudes and their buying behavior. Small city CBD shoppers tended to be older, be persons of modest means, or be persons in the upper income levels. Suburban shoppers were generally in the middle groups in terms of age, education, income, and family composition characteristics. Estimates of purchases of shopping goods items indicated substantial shopper mobility from the small city. A group of shoppers evidencing high mobility was composed of younger, higher income, and "white collar" employed persons.

•THE vast growth of population that followed World War II exploded into the suburbs of the American city and with the expansion of suburban population came the corresponding shift or decentralization of retail trade. Throughout the country, the suburban shopping centers have and are taking an ever-increasing share of the retail expenditure.

During the past two decades, a great deal of material was published that speculated on the ability of the retail facilities to sustain themselves or to compete effectively with suburban stores. Concern over the decentralization of retail trade went well beyond the

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confines of the retail community; at stake was the 15 to 25 percent of the typical city's real property assessment that is found in the central business district (CBD).

In relative terms, many data were furnished concerning the cities and metropolitan areas that are part of a standard metropolitan statistical area. Relatively meager information is to be found concerning the smaller city, here defined as a city under 50,000 in population, that is troubled with many of the same problems of decentralization of retail trade. Smaller cities face similar concomitant problems of physical deterioration, congestion, and lack of parking facilities.

Ample evidence would indicate that small cities are unique in many respects and are not necessarily large cities in miniature. As Voorhees, et al observed, unlike large metropolitan areas, shoppers in small cities are largely dependent on the CBD for both convenience and shopping goods (1). In cities up to 50,000 population, estimates show that 80 percent of the total retail sales are found in the CBD. The dependence on the private automobile was shown by Burrage and Mogren who estimated that in terms of traffic entering the CBD's per 1,000 population, the vehicular volume of small cities is nearly fourteen times that of large cities (2). Further, the small city does not have the mass of people necessary to support a mass transportation system.

The small city presents an added dimension to the general problem of retail store decentralization. In larger cities, the competitive situation is one in which the stores in the CBD are pitted against a variety of suburban centers or stores. However, in the smaller city, the downtown stores compete not only with the suburban facilities, but also compete with larger metropolitan areas that are within a few hours' driving distance.

Therefore, this study was concerned with the problem of uncovering some of the differences in shopper attitude peculiar to the size of a city, as a necessary step in studying the specific nature of small city CBD's and their interrelationships with their suburban shopping areas.

The significance of shopper attitudes was demonstrated by C. T. Jonassen (3). Shopper attitudes were shown to be based on attraction to or rejection of a shopping area in view of the area's advantages or disadvantages. The advantages and disadvantages were given in terms of cost, time, energy, and physical conditions. Thus, shopper attitudes were held to be the key factors in determining preferences for shopping areas.

CHARACTERISTICS OF THE SUBJECT CITY

The setting for the study was Middletown, N.Y., which is in many respects a typical small city. The city's population has remained somewhat stable at about 22,000 persons for the past four decades. Approximately 70 miles northwest of New York City, Middletown is in Orange County, which is the outermost fringe of the counties comprising the New York Metropolitan Region. While the County is one of the least densely populated in the Region, it has experienced great population growth within the past decade. Although a handful of persons commute daily to the New York City metropolitan area, the city may in no way be considered a suburban community. The area is designated a "light commuting" county, that is, relatively few residents work outside of the county.

The Chamber of Commerce lists 33 manufacturing firms which employ a total of 2,600 employees. Of these manufacturing firms, only 13 employ 100 or more workers. Principal industries are apparel and leather goods; the surrounding area has considerable dairy and vegetable farming. By far, the largest employer is the Middletown State Hospital with approximately 1,400 persons. The greatest majority of the retail stores are owner-managed.

Retail sales have risen at a much faster rate in the county, and the city's share of the county's retail sales declined from a high of 21.7 percent in 1939 to a low of 15.7 percent in 1963. The continuing percentage decline in retail sales of the city in relation to the county indicates increased business activity in the county's unincorporated areas. Suburban shopping outlets and stores are of course located in the unincorporated areas. At the time of the study, there were no controlled suburban regional shopping centers in the immediate Middletown area. Suburban stores consisted mainly of traditional supermarkets, a supermarket with a very large nonfoods operation, variety stores, service retailers, and a discount clothing and housewares operation.

THE PROCEDURE

A random sample of residents of the city of Middletown and the immediate surrounding area were interviewed by community college students in order to determine their attitudes towards the CBD and the suburban shopping areas. The author, Associate Professor of Business Administration at Orange County Community College, used students in his marketing and retailing classes to conduct the shopper interviews.

Students were given intensive instruction both in and outside of the classroom in the techniques of interviewing. Interviews were carefully checked and validated, the questionnaire was coded, and the information was punched into IBM cards. About 90 students participated as interviewers in the study; others edited questionnaires and assisted in the compilation of the data.

The composition of the total Middletown sample was remarkably similar to the samples in Columbus, Houston, and Seattle. With the exception of data on family income, the various proportions within each subdivision of the sample (such as age, education, marital status, sex, home ownership, occupation, and number of children under 12 per family) either fall within the limits of the large city samples or very close to the limits. Aside from income levels, there were no significant differences in the samples. No doubt pressures of inflation have raised income levels in the intervening time between the large city studies and the Middletown study.

In the Jonassen study, a base of 600 shopper interviews was used in each of the larger cities; for ease in making comparisons, the same number of interviews were conducted in Middletown. Two schedules of statements were taken from the Jonassen study. The first schedule of statements was a list of 23 satisfaction factors or items that related to shopping situations. The second schedule of statements consisted of a list of criteria that required shoppers to rank the advantages and disadvantages of the downtown and suburban shopping areas.

It was felt that the identical schedule of statements should be used so that exact comparisons could be made to the larger cities. Further, it was understood that a few questions were not germane to a small city and that possibly dramatic changes had occurred in the intervening time in the larger cities so that current responses may have been somewhat different. However, the advantages of using the identical statements tended to outweigh the drawbacks.

Additional questions that dealt with shopper use of the CBD were asked and estimates were also requested for purchases of six different shopping goods items in the CBD, the suburban area, and in the metropolitan areas away from Middletown. Demographic profiles were composed of shoppers who showed strong preferences for either the downtown or the suburban areas. These shoppers were designated as downtown-oriented or suburban-oriented based on their beliefs of superiority, their shopping frequency, and their actual buying patterns in the particular area. Another demographic profile was composed of a group of shoppers who estimated substantial amounts of purchases in the metropolitan areas away from the home city.

FINDINGS

Table 1 gives the schedule of items and the responses by the Middletown sample to the 23 satisfaction items. Responses are listed in the order of most highly favored responses to least favored responses to the CBD. Respondents indicated whether in their opinion the downtown area or the suburban area held the advantage for the particular item. As an alternative, shoppers were able to designate an item as "no concern" to them, or in cases where the respondent did not believe that either the downtown or suburban area clearly had the advantage, they indicated "undecided." For example, a childless respondent would mark the item "easier to take children shopping" as "no concern" or NC. A respondent who was not sure if the downtown or suburban areas offered "cheaper prices" would indicate "undecided" or UN.

Remarkable consistency of response was found in the results of the same schedule of questions in Columbus, Houston, and Seattle. Table 2, in which the Middletown responses are added to those that appeared in the Jonassen study, illustrates the differences and the similarities in response.

TABLE 1

PERCENTAGES OF SAMPLES INDICATING SUPERIORITY OF DOWNTOWN OR SUBURBAN SHOPPING CENTERS
(N = 600)

Shopping Satisfaction Factors	DT* (%)	SSC* (%)	UN* (%)	NC* (%)	No Data (%)	Total (%)
Better quality goods	76.8	8.7	12.0	2.3	0.2	100
Takes less time to get there	66.3	19.3	9.0	5.2	0.2	100
More dependable guarantees of goods	66.1	9.4	18.6	5.4	0.5	100
More convenient to public transportation	65.6	4.5	6.5	23.4		100
Goods more attractively displayed	63.8	18.3	13.3	4.6		100
Better place to establish a credit rating	61.2	4.2	13.3	21.3		100
Cost of transportation less	60.0	9.5	11.0	19.2	0.3	100
Better delivery service	59.7	3.5	9.5	27.3		100
Easier to return and exchange goods bought	59.1	12.5	19.0	9.2	0.2	100
Better place to combine different kinds of shopping and other things one may want to do	52.6	40.5	5.4	1.5		100
Easier to establish a charge account	51.8	5.0	15.7	27.3	0.2	100
Greater variety of styles and sizes	51.5	35.7	10.2	2.6		100
Greater variety and range of prices and quality	42.8	44.0	11.7	1.5		100
Less tiring	41.5	35.3	17.0	6.2		100
Less walking required	39.9	47.0	9.1	3.7	0.3	100
Better places to eat lunch	38.7	36.0	11.1	13.7	0.5	100
Best place to meet friends from other parts of the city for a shopping trip together	37.2	34.8	8.2	19.3	0.5	100
The right people shop here	28.6	9.5	22.5	38.4	1.0	100
It is the better place for a little outing away from home	25.1	46.8	10.0	16.7	0.3	100
More bargain sales	21.5	58.0	12.7	7.5	0.3	100
Easier to take children shopping	14.0	32.6	8.3	44.6	0.5	100
Cheaper prices	10.3	67.4	17.3	0.5		100
Keep open more convenient hours	9.0	77.4	5.0	8.3	0.3	100

*DT—downtown, SSC—suburban shopping center, UN—undecided, NC—item is of no concern.

TABLE 2

PERCENTAGES OF SAMPLES INDICATING SUPERIORITY OF DOWNTOWN OR SUBURBAN SHOPPING CENTERS
(N = 600)

Shopping Satisfaction Factors	Columbus		Houston		Seattle		Middletown	
	DT*	SSC*	DT*	SSC*	DT*	SSC*	DT*	SSC*
DT advantages:								
Greater variety of styles and sizes	86.3	2.3	87.6	4.0	90.0	1.3	51.5	35.7
Greater variety of range of prices and quality	81.1	1.7	83.1	5.0	84.6	2.6	42.8	44.0
More bargain sales	65.5	2.7	70.8	6.7	68.4	1.5	21.5	58.0
Best place to meet friends from other parts of the city for a shopping trip together	66.9	11.5	65.1	16.0	66.4	12.4	37.2	34.8
Better places to eat lunch	61.3	7.9	49.0	26.7	68.3	8.6	38.7	36.0
Better places to establish credit rating	38.5	4.8	50.2	8.4	29.5	4.8	61.2	4.2
More convenient to public transportation	52.5	14.2	44.4	17.8	61.3	6.8	65.6	4.5
Better delivery service	37.2	5.4	44.5	8.0	37.5	3.2	59.7	3.5
Cheaper prices	46.6	7.9	51.5	8.6	49.0	3.8	10.3	67.4
Goods more attractively displayed	44.1	16.3	67.9	6.5	51.6	4.8	63.8	18.3
Better place to combine different kinds of shopping and other things one may want to do	56.3	29.7	72.3	20.6	71.6	16.8	52.6	40.5
Easier to return and exchange goods bought	39.5	13.3	31.0	37.7	29.3	12.3	59.1	12.5
Easier to establish a charge account	30.1	5.2	33.5	7.3	27.2	3.5	51.8	5.0
More dependable guarantees of goods	34.2	10.0	38.8	14.4	27.5	4.3	66.1	9.4
Better quality of goods	27.3	15.0	42.0	7.7	49.0	3.8	76.8	8.7
It is the better place for a little outing away from home	38.5	33.2	50.2	28.5	42.4	35.6	25.1	46.8
SSC advantages:								
The right people shop here	10.3	21.5	15.3	15.5	2.1	7.3	28.6	9.5
Cost of transportation less	15.7	59.3	4.0	72.4	10.0	53.1	60.0	9.5
Keep open more convenient hours	16.3	62.6	9.1	51.6	8.3	44.9	9.0	77.4
Less walking required	16.3	69.9	13.6	72.4	14.0	67.8	39.9	47.0
Easier to take children shopping	2.5	47.6	1.6	60.9	2.1	47.4	14.0	32.6
Less tiring	9.3	75.0	9.0	75.4	9.5	70.8	41.5	35.3
Takes less time to get there	12.3	78.9	9.6	78.8	25.3	65.1	66.3	19.3

*DT—downtown; SSC—suburban shopping center.

The Downtown Areas Compared

Shoppers in the three larger cities appeared quite sure that the downtown area offered "greater variety of styles and prices." They responded with preferences of 86.3, 87.6, and 90.0 percent. Middletown respondents appeared less sure, only 51.5 percent felt that "greater variety of styles and sizes" were found in the CBD. The Middletown suburban area received a preference of 35.7 percent on this statement compared to a 2.3, 4.0, and 1.3 percent response in the larger cities.

The downtown areas of the three larger cities were favored by the statement "greater variety and range of prices and quality" by percentages of 81.1, 83.1, and 84.6 as compared to only 42.8 of Middletown shoppers. The Middletown suburban area was favored by this factor by 44.0 percent of the sample. Responses in the three larger cities indicating the advantage for the suburban area were 1.7, 5.0, and 2.6 percent.

"More bargain sales" were found in the downtown area of the three larger cities by percentages of 65.5, 70.8, and 68.4; only 21.5 percent found this to be the case in Middletown. Significantly 58.0 percent thought there were "more bargain sales" in Middletown's suburban area compared with 2.7, 6.7, and 1.5 percent in the three larger cities. Closely related was the statement "cheaper prices" that were found to be favored by 46.6, 51.5, and 49.0 percent in the larger cities in the downtown area. Only 10.3 percent of the Middletown choices indicated "cheaper prices" in the downtown area while 67.4 percent thought the suburban area had "cheaper prices." Only 7.9, 8.6, and 3.8 percent thought "cheaper prices" existed in the suburban areas of the larger cities.

Several other factors when grouped together indicate an important difference between large and small city attitudes toward the CBD. One of the strengths of a downtown area is its diversity. Along with shopping, the downtown area generally provides many related business activities, professional services, municipal and governmental agencies, various forms of entertainment, and a greater variety of eating places. The diversity of facilities may be considered an environmental factor. Middletown is somewhat weaker than the larger cities in this environmental factor.

The statements "best place to meet friends from other parts of the city for a shopping trip together," "better places to eat lunch," "better place to combine different kinds of shopping and other things one may want to do," were heavily favored in Houston and Seattle. Middletown shoppers did not think that the downtown area was as superior on these three statements since the opinions are close to being evenly divided. "It is a better place for a little outing away from home" favored by the larger cities by percentages of 38.5, 50.2, and 42.4 for the downtown area, was indicated by only 25.1 percent of the Middletown shoppers. On this statement, the suburban area was the preference by 46.8 percent. However, in regard to the statement "it is a better place for a little outing away from home," it should be noted that the samples in the larger cities covered a much wider geographic area.

Statements indicating a preference by both the larger city and Middletown shoppers for the downtown area were: "better place to establish a credit rating," "more convenient to public transportation," "better delivery service," "easier to return and exchange goods bought," "easier to establish a charge account," and "more dependable guarantees on goods." While 27.3, 42.0, and 49.0 percent of the large city samples thought that the downtown area had "better quality goods," an impressive 76.8 percent of the Middletown shoppers felt this was the case. Only 8.7 percent of the Middletown sample thought that the suburban areas had better quality goods.

The Suburban Areas

Shoppers in the Jonassen study indicated that the suburban shopping centers had the advantage on these seven factors: "the right people shop here," "cost of transportation less," "keep open more convenient hours," "less walking required," "easier to take children shopping," "less tiring," and "takes less time to get there." On four of these seven factors, "the right people shop here," "cost of transportation less," "takes less time to get there," and "less tiring," the Middletown opinion is the reverse of that shown in the larger cities.

Middletown shoppers favored the downtown area on the statement, "cost of transportation less" by a total of 60.0 percent while the large city shoppers showed preferences for suburban centers on this item by percentages of 59.3, 72.4, and 53.1. "Takes less time to get there" was chosen by 66.3 percent of the Middletown sample as a downtown advantage while shoppers in the three large cities thought just the opposite. Since the greatest part of the sample resided within the city of Middletown, responses to the statements "cost of transportation less," and "takes less time to get there," would probably not be typical of shoppers within the extended trading area.

Shoppers thought that "less walking required" was a downtown advantage unlike shoppers in the three larger cities who indicated this statement as a suburban area advantage. Also Middletown shoppers thought the downtown area was "less tiring," again the reverse sentiment of the large cities.

With regard to the statements "keep open more convenient hours" and "easier to take children shopping," Middletown shoppers favored the suburban areas as did large city respondents. "The right people shop here" was not a clear-cut advantage of the suburban area in the three large cities, but Middletown shoppers felt that in this case, the downtown area held the advantage.

The Comparative Importance of Factors

In addition to identifying factors of concern, the relative weight given to the factors is also of great importance. Shoppers were asked to rank the advantages and disadvantages of both the downtown and suburban areas. The present section analyzes responses to the question, "Which do you think are the most important advantages of shopping downtown, starting with the most important advantages first, the next most important next, and so on, numbering them '1', '2', '3' in order of importance?" This question was repeated for disadvantages of downtown and for advantages and disadvantages of the suburban shopping areas.

To determine the rank order of advantages and disadvantages, a composite rank was calculated for each factor by giving a weight of three for the first choice, two for second choice, and one for third choice. Percentages indicated for each item were then multiplied by the appropriate weight, the sums of the products of each item determining its rank in the list of advantages and disadvantages. This procedure was the same as that used in the Jonassen study.

Table 3 compares the ranks given to various factors by Middletown shoppers regarding the advantages of downtown to those in the larger cities.

"Large selection of goods," "can do several errands at one time," and "cheaper prices" were ranked first, second, and third, respectively, in the larger cities. Middletown shoppers gave first rank to "close to home," while all of the larger cities assigned this factor to eighth or last place. Assignment of the top rank to "close to home" in Middletown is probably, in a large part, a result of the greater geographic concentration of the sample. "Can do several errands at one time" ranked second in Middletown as

TABLE 3

RANKING OF CERTAIN ADVANTAGES OF DOWNTOWN SHOPPING
(N = 600)

Advantages	Composite Ranking			
	Columbus	Houston	Seattle	Middletown
Larger selection of goods	1	1	1	4
Can do several errands at one time	2	2	2	2
Cheaper prices	3	3	3	8
Convenient public transportation	4	5	4	5
Stores close together	5	4	5	3
Enjoyable place to shop	6	6	6	6
Better delivery service	7	7	7	7
Close to home	8	8	8	1

TABLE 4

RANKING OF CERTAIN DISADVANTAGES OF DOWNTOWN SHOPPING
(N - 600)

Disadvantages	Composite Ranking			
	Columbus	Houston	Seattle	Middletown
Difficult parking	1	1	1	1
Too crowded	2	2	2	6
Congested traffic	3	3	5	2
Too far to go	4	5	6	8
Takes too long to shop there	5	4	4	3
Poor public transportation	6	6	7	5
Unfriendly service	7	8	8	4
Cost of transportation too high	8	7	3	7

well as the three larger cities. Third rank in Middletown fell to "stores close together," while the larger cities ranked this factor as fifth, fourth, and fifth place, respectively.

The most dramatic differences in ranking of advantages of downtown between Middletown and the larger cities were the two items, "large selection of goods," and "cheaper prices." As stated, "large selection of goods" was ranked first in all of the large cities but ranked fourth in Middletown. "Cheaper prices" ranked third in all of the large cities but ranked eighth or last in Middletown.

Table 4 compares the ranks given to various factors by Middletown shoppers to those in the large cities in regard to disadvantages of downtown shopping. "Difficult parking" was the greatest disadvantage of downtown in the view of Middletown shoppers as well as the number one disadvantage of the three larger cities. "Too crowded" ranked second in the three larger cities but ranked sixth in Middletown. While "congested traffic" ranked third, third, and fifth, respectively, in the three larger cities, it ranked second in Middletown. Third rank in disadvantages of downtown in Middletown went to "takes too long to shop," whereas this item was ranked fifth, fourth, and fourth in the larger cities. One of the more important differences in rank is the item "unfriendly service" that ranked fourth in Middletown but ranked seventh, eighth, and eighth in the larger cities.

The greatest advantage of the suburban area (Table 5) according to Middletown shoppers was "more convenient hours." "More convenient hours" ranked third, fifth, and fifth, respectively, in the three larger cities. "Parking easy" ranked second in Middletown and was ranked second, fourth, and second, respectively, in the large cities. Third rank in Middletown went to "clean and modern stores"; this item ranked eighth in all of the three larger cities. Interestingly, "closer to home" ranked as the first or greatest advantage in all of the larger cities but ranked seventh in Middletown.

The greatest disadvantage of the suburban areas according to Middletown shoppers was "poor public transportation." "Poor public transportation" ranked fourth, fourth,

TABLE 5

RANKING OF CERTAIN ADVANTAGES OF SUBURBAN SHOPPING CENTERS
(N = 600)

Advantages	Composite Ranking			
	Columbus	Houston	Seattle	Middletown
Closer to home	1	1	1	7
Parking easy	2	4	2	2
More convenient hours	3	5	5	1
Less crowded	4	3	4	5
Do not have to dress up	5	2	3	4
Friendly and courteous clerks	6	6	6	6
Less noise and confusion	7	7	7	8
Clean and modern stores	8	8	8	3

TABLE 6

RANKING OF CERTAIN DISADVANTAGES OF SUBURBAN SHOPPING CENTERS
(N = 600)

Disadvantages	Composite Ranking			
	Columbus	Houston	Seattle	Middletown
Lack of large selection	1	1	1	5
Not all kinds of business represented	2	2	2	3
Prices too high	3	3	3	7
Poor public transportation	4	4	5	1
Poor delivery service	5	5	6	4
Too far to go	6	6	4	2
Hard to get credit	7	8	8	8
Bus fare too high	8	7	7	6

and fifth, respectively, in the larger cities. "Too far to go" ranked second in Middletown but this item ranked sixth, sixth, and fourth in the large cities. The third greatest disadvantage of suburban areas according to Middletown shoppers was "not all kinds of business represented." This item ranked second in all of the larger cities. "Prices too high" ranked third in all three large cities but this item was ranked seventh in the Middletown sample. "Lack of large selection," ranked first in all three large cities, was ranked seventh by Middletown shoppers. Table 6 gives the ranked disadvantages of Middletown and the three larger cities for the suburban area.

Summary of Similarities and Differences

Both similarities and differences in shoppers' attitudes exist between the Middletown study and the Jonassen study. In addition, a number of similarities in the findings vary in degrees of intensity. For example, a given item may be found to be an advantage of the downtown area in the larger cities as in Middletown but the response to the item in the Middletown area may be far less or far more decisive.

The Middletown data may be summarized and compared to the three larger cities, by a discussion of the following key factors:

1. Quality of Goods. The Middletown downtown area enjoys the advantage of offering better quality merchandise in the view of the shoppers by a far greater degree than in the larger cities or in the suburban locations. An impressive 76.8 percent of the sample thought the downtown facilities offered "better quality goods" compared to 27.3, 42.0, and 49.0 percent of the larger cities.

2. Depth of Merchandise Selection. "Greater variety of styles" and "greater variety of range of prices and quality" are generally conceded to be downtown advantages. Over 80 percent of the shoppers in all of the three larger cities felt that the downtown area had the advantage of having greater variety and range of merchandise selection. In Middletown, only 51.5 percent of the sample thought that downtown had "greater variety of styles and sizes," while more people (44.0 percent) felt that the suburban area gave "greater variety and range of prices and quality."

3. Prices. Generally, the downtown area is the area of greatest price competition. Large city shoppers all thought that downtown had "cheaper prices" and "more bargain sales" by extremely wide majorities. The term "cheaper prices" as used in this study denoted competitiveness of prices, and the term "more bargain sales" meant the propensity to run sales, special promotional events, etc. Just the opposite is true in Middletown. Shoppers in Middletown overwhelmingly felt that the suburban area had the advantage in providing lower, more competitive prices, and conducted more promotional events.

4. Services. Downtown stores have always given a wide range of services. Shoppers in the three large cities indicated that in terms of establishing credit, receiving deliveries, exchanging merchandise, and reaching public transportation, the downtown area held the advantage. Middletown shoppers agreed with their large city counterparts in favoring the downtown area for better services but by far smaller margins.

Middletown shoppers also agreed with large city shoppers that the suburban stores keep "more convenient hours." A very high 77.4 percent of the Middletown sample thought that suburban stores' hours were more convenient.

5. Environmental Factors. Usually one of the drawing powers of a downtown area is its diversity of offerings and its facilities. Middletown shoppers recognized and appreciated the diversity of the downtown area but to a lesser degree than the large city shoppers. The importance of diversity was pointed out by Voorhees, et al who mention that in Kansas City, "40 percent of the persons who made purchases in 14 downtown stores came to the central business district for some reason other than shopping."

Shopper Profiles

Analysis of the questionnaires showed that some respondents were strongly disposed toward either the downtown or the suburban area. Shoppers were considered oriented toward an area according to a formula that took into account the shoppers' opinions regarding the superiority of the area, the shopping frequency in the area, the location of the most recent shopping goods purchase, and the estimates of the amount of various shopping goods purchased in the area. Of the total sample of 600 respondents, 266 were designated downtown-oriented, 78 were designated suburban-oriented, and the 256 respondents who showed no clear tendency toward either area were designated unclassified.

In terms of demographic characteristics, downtown-oriented shoppers tended to be older, to be persons of modest means, or to be persons with above-average incomes and educational levels. For example, the heavy proportion of older persons was indicated since 50 percent of all persons age 54 to 65 and 68 percent of all of those over 65 in the entire sample were downtown-oriented.

Persons of modest means were well represented in the downtown-oriented group. About 40 percent of the workers in the age 25 to 49 who earned from $4,000 to $6,000 a year and over 64 percent of all those who earned less than $4,000 a year were downtown-oriented. At the other extreme, slightly less than one-half of those earning over $10,000 and 48.5 percent of those with a college education were also classified as downtown-oriented.

Because there were far fewer suburban-oriented shoppers, the profile is less sharply defined. The suburban-oriented shopper appears to be a midgroup in the following sense: in terms of age, most are found in the 25 to 49 age group; in educational achievement, the greatest numbers are found in the 9 to 12-year level; in income, most are found between $4,000 and $10,000 level; and in terms of family composition, most have one or two children below 12 years of age.

Shopper Mobility

As an indication of satisfaction or dissatisfaction with the facilities in the Middletown vicinity, shoppers were asked to estimate their purchases in the downtown area, the suburban area, and in the metropolitan areas away from Middletown. Estimates were requested for purchases of men's wear, women's wear, women's accessories, children's wear, home furnishings, and electrical appliances.

In practical terms, shoppers have great difficulty making accurate estimates of purchases. Consequently, only judgments by shoppers of one-half or more purchases were considered to be indicative of a substantial amount of buying. Table 7 gives the number of shoppers and corresponding percentages of the shoppers who estimated one-half, three-fourths, or all of their purchases in either the downtown area, the suburban area, or the areas away from the Middletown vicinity for each of the shopping goods items.

Responses in Table 7 are duplicated, that is, an individual respondent who agreed to make the estimates may have mentioned that he purchased one-half of his men's wear in the downtown area and the other half in the suburban area, three-fourths of his children's wear purchases in the suburban area, and all of his home furnishings purchases away from the Middletown area, etc.

In order to gain a clearer view of shopper mobility, an additional classification of shoppers was delineated called the "away" group. The "away" group consisted of an unduplicated group of shoppers who estimated at least one-half or more purchases of at

TABLE 7

RESPONDENTS' ESTIMATED PURCHASES IN THE DOWNTOWN AREA, SUBURBAN AREAS, AND AREAS AWAY FROM MIDDLETOWN

Purchases	Number*	DT Area (%)	SSC Area (%)	Away Area (%)	Total (%)
Men's wear:					
1/2	130	46.9	43.8	9.2	100
3/4	148	58.1	23.6	18.2	100
All	218	80.3	15.6	4.1	100
Women's wear:					
1/2	170	50.0	30.0	20.0	100
3/4	175	61.1	14.9	24.0	100
All	237	74.3	15.2	10.5	100
Women's accessories:					
1/2	158	47.5	38.0	14.6	100
3/4	117	56.4	21.4	22.2	100
All	254	81.1	12.2	6.7	100
Children's wear:					
1/2	116	44.8	37.1	18.1	100
3/4	90	42.2	38.9	18.9	100
All	143	62.2	28.7	9.1	100
Home furnishings:					
1/2	95	45.3	31.6	23.2	100
3/4	96	59.4	22.9	17.7	100
All	218	81.7	6.9	11.5	100
Electrical appliances:					
1/2	105	49.5	37.1	13.3	100
3/4	79	68.4	20.3	11.4	100
All	223	77.6	13.0	9.4	100

*Table reads that 130 persons indicate one-half of their purchases of men's wear were made in one of the three areas; 46.9 percent of the 130 persons indicated the downtown area, 43.8 percent the suburban area, and 9.2 percent the areas away from Middletown. No doubt many of the same persons were represented in other shopping goods categories.

least one of the six categories of shopping goods items away from the Middletown area. In all, there were 166 "away" shoppers of whom 50 were already classified as downtown-oriented.

In demographic terms, the "away" shopper tended to have greater representation in the younger age levels, to have higher educational achievement, to have above-average income, to have a greater share of professional and managerial position, and to have children under 12 years of age.

CONCLUSIONS

1. Disadvantages of the CBD are similar for both large and small cities, but the small city CBD has fewer of the offsetting advantages. For example, difficult parking was the number one problem in both studies, but the data indicated that this problem was minimized in the large CBD since it offered a better chance of meeting needs and getting products for less money.

2. In the large cities, the higher socioeconomic group tended to be loyal to the downtown area since this area furnished the highest quality and greatest selection of goods. In Middletown, a good portion of the higher socioeconomic group tended to be loyal to the CBD as well, but many of this same group tended to be mobile and do substantial amounts of shopping in the New York City Metropolitan Area.

3. Because of its relatively weak shopping goods position, the small city CBD is more susceptible to the inroads of suburban and metropolitan area competition.

4. The future of the small city CBD is probably more uncertain than its large city counterpart. There would appear to be less opportunity for younger persons to develop the habit of shopping downtown.

5. Renewal, rejuvenation, improved traffic control, and an influx of progressive merchants are just as sorely needed in the small city CBD for its future development as in the large city CBD.

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A Valuation of Information Sources and Cues by Motorist-Traveler Guests of Lodging Establishments

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One of the specific requirements of the Highway Beautification Act of 1965 was to ascertain the effects of signboard regulation, control, and/or removal on consumer-travel choices—especially transients' choices.

The research technique utilized to determine attitudes or judgments concerning the importance of information sources and cues to individuals was the paired comparison technique devised by Leon L. Thurstone. This psychometric research technique permitted comparisons by an individual of the characteristics of an advertising medium, but more importantly, the technique allowed inter-media comparisons. Both media and media-non-media comparisons were obtained and analyzed for respondents who were familiar with the general metropolitan area and for those who were not familiar with the area.

The findings of the research were as follows: (a) physical appearance of the lodging establishment was considered the most important information source; (b) off-premise commerical billboards ranked second in a set of six media-oriented information sources for the entire sample as well as for those travelers not familiar with the area; (c) when the paired comparisons were expanded to include ten media and non-media-oriented sources, billboards dropped to sixth position; and (d) the importance of non-media-oriented information sources to motorist travelers is evidenced by the fact that advice of individuals, referral services, and reservation services outranked all of the media-oriented information sources.

•ONE of the specific requirements of the Highway Beautification Act of 1965 was to ascertain the effects of signboard regulation, control, and/or removal on consumer-travel choices—especially transients' choices.

This major question suggests others. For example, is the information provided by advertising signs significant to the motorist traveler? Does the removal of signboards create costs to the motorist traveler? Or do the present signboards contribute significantly to the motorist travelers' conscious perceptions of the process of identifying, choosing, or locating lodging establishments? This paper abstracts from these questions and specifically provides a partial answer to the following question: Do off-premise, media and non-media-oriented information sources and cues affect the choices of lodging establishments by on-highway private automobile users (motorist travelers)—both those familiar and those not familiar with lodging establishments in a given area?

The problem is not simple since measurement of the influence of advertising on the perception or judgments of an individual requires an analysis of the relationship of an object (product and/or service) to an individual. An accepted research technique for

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determining attitudes or judgments concerning the importance of information sources and cues to individuals is the paired comparison technique devised by Leon L. Thurstone. This psychometric research technique permits comparisons by an individual of the characteristics of a medium, but more importantly, the technique allows intermedia comparisons and hence was ideally designed to accomplish the stated objective of this research effort.

Briefly, the technique (1) requires arranging items in pairs so that each item is paired with each other item once. The validity of the method lies in the fact that it forces choice and depends upon the number of pairs being comparatively large, easily identifiable, and easily distinguishable, and also depends upon the number of respondents being rather large and reasonably homogeneous. The forced-choice process of the paired comparison technique overcomes individual bias on the part of respondents about the items in the pairs. The results of each individual test cannot be scored. The results are obtained for the entire group by computing the proportion (decimal fraction) of choices favoring each item over each other item in the total number of choices made. The computations performed on these quantities result in the construction of an interval scale of perceived degree of importance in terms of the frame of reference being used for ranking.

RANK ORDER AND RELATIVE IMPORTANCE OF MEDIA-ORIENTED INFORMATION SOURCES AND CUES

Interviews with motorist travelers (automobile travelers) who were registered in a given highway-oriented lodging establishment were obtained in 15 selected metropolitan

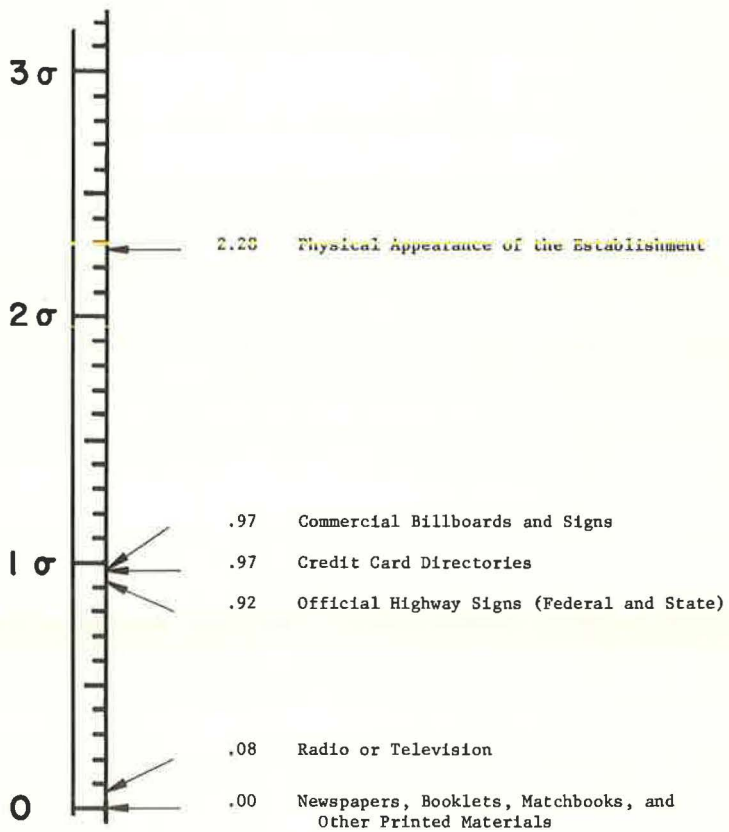

Figure 1. Sigma values derived from motorist travelers' paired comparison judgments of media-oriented information sources and cues.

Birmingham, Alabama, lodging establishments. The sample includes 133 motorists who were registered in motels.

Motorist-traveler respondents supplied paired judgments of six essentially media-oriented information sources and cues, and the results are shown in Figure 1. The Thurstone-type scale utilizes the standard deviations of the dispersion of preferences (sigma) as the unit of measurement. In constructing the scale, the information source or cue judged lowest in rank is used as a zero point, and all others are placed in ascending order according to rank and interval. Such an arrangement is considered better than assigning the origin to the cue highest in order of preference for the reason that it provides positive scale values (a "thermometer" approach as opposed to a "depth gage" approach). This placement of the zero should not be interpreted to mean the factor at the origin has no value to the motorist traveler.

The scale depicts a rank order of the information sources and cues as follows: (a) physical appearance of the establishment, (b) commercial billboards and signs, (c) credit card directories, (d) official highway signs (federal and state), (e) radio or television, and (f) newspapers, booklets, matchbooks, and other printed materials.

Physical appearance of the lodging establishment ranks at the top of the scale and is considered to be the most important factor influencing the choices of the sample of motorist travelers. The high positive value (discriminal difference) of physical appearance of the lodging establishment is pronounced in terms of the absolute level obtained and in relative terms to the other items on the scale. (Preliminary experimentation in converting ordinal values to cardinal values has been performed with a moderate level of success.)

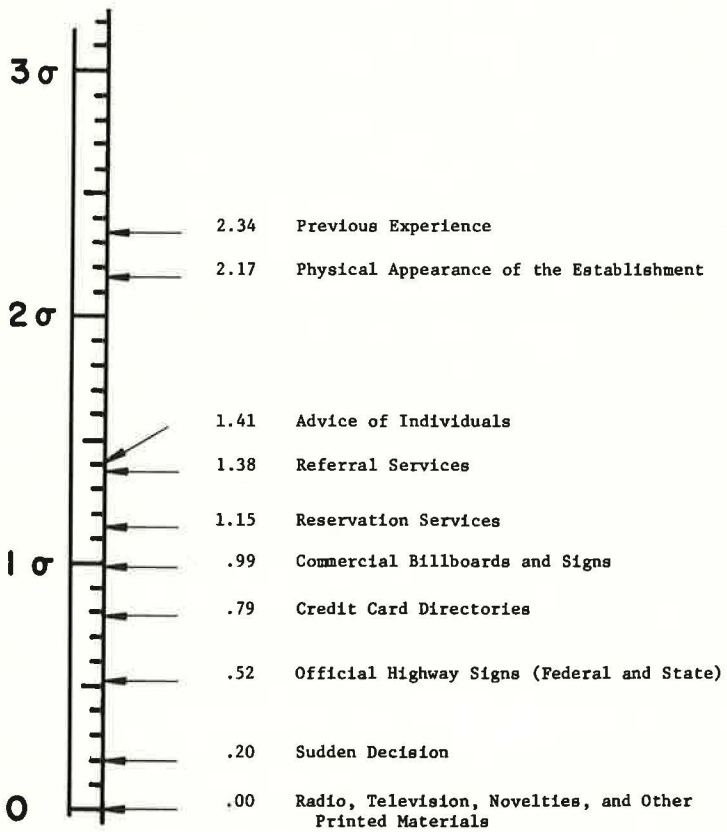

Figure 2. Sigma values derived from motorist travelers' paired comparison judgments of media and non-media-oriented information sources and cues.

The next five information sources and cues (Fig. 1) depict relatively small scalar separations. Even though the scale separations are small, the inferences are significant. The rankings of the items are easily identified, but more importantly, the respondents apparently saw only limited values in the five items as information sources or cues, compared to the first ranking item. Sigma values for commercial billboards and signs, credit card directories, and official highway signs are clustered near the 1-σ level, and relatively unimportant differences characterize the cluster. Broadcast and print media cluster near the point of origin on the scale and were consistently rated at this level by the respondents.

RANK ORDER AND RELATIVE IMPORTANCE OF MEDIA AND NON-MEDIA-ORIENTED INFORMATION SOURCES AND CUES

The same sample of motorist travelers supplied paired judgments of a list of media and non-media-oriented information sources and cues. This second listing (Fig. 2) permits observations as to whether the rankings and scalar distances in Figure 1 retain a consistent order and/or maintain the same relative importance to other information sources and cues.

The rank order of the information sources and cues (Fig. 2) is as follows: (a) previous experience, (b) physical appearance of the establishment, (c) advice of individuals, (d) referral services, (e) reservation services, (f) commercial billboards and signs, (g) credit card directories, (h) official highway signs (federal and state), (i) sudden decision, and (j) radio, television, novelties, and printed materials.

The clustering characteristics in Figure 1 are not as apparent in Figure 2. Separations of the items on the scale in Figure 2 are more clearly demarcated, and except for the most important two items, the scalar items depict relatively regular dispersion. The addition of the non-media-oriented information sources and cues in Figure 2 to the original listing apparently served the motorist-traveler respondents as agents for further discrimination. The items included in the second list acted as disassembling agents for the respondents' ranking efforts. Such items as sudden decision, reservation service and referral services depict an orderly relationship with the original items appearing in Figure 1. Three of the new items (advice of individuals, referral services, and reservation services) were considered by the motorist travelers to be more important than all but the highest ranked item in Figure 1.

Other observations about the judgments of the respondents include the following:

1. Even though discriminal differences are weak in Figure 1 except for one item, physical appearance of the establishment, the orderliness of the results obtained in the Figure 1 scale is confirmed by the order of these items in Figure 2.
2. Motorist travelers indicate that media-oriented information sources and cues are secondary to non-media-oriented sources and cues which depend upon, for instance, personal contacts, habit, reputation, services, and sensory satisfactions.
3. An item included in the non-media-oriented list which does not fit tightly within the framework of information sources and cues is the term "sudden decision." Apparently few motorist travelers felt that they made sudden decisions concerning choice of lodging establishments, but even this item is considered to be more important than radio, television, and printed materials.

The importance of media and non-media-oriented sources and cues for both motorist travelers familiar with the study area and those not familiar with the study area were subjected to analysis via the Thurstone paired comparison technique. Results were as follows:

1. The regularity and the scale differences for both groups corresponded closely to the scalar solution presented in Figure 1.
2. The dominant item (physical appearance of the establishment) was the same for the familiar and non-familiar groups.

3. The most important difference between the familiar and non-familiar groups is that there were rank order shifts of the remaining five media-oriented information sources and cues.

SUMMARY

1. Even though off-premise commercial billboards and signs are consistently judged most important among the pure media-type information sources and cues, this item actually ranks second in the set of six media-oriented information sources for the entire sample of motorist travelers as well as for motorist travelers not familiar with the area. When the list was expanded to include ten media and non-media-oriented items, billboards dropped to sixth position, but still outranked all other media.

2. The importance of the non-media-oriented information sources to motorist travelers can be highlighted by the fact that advice of individuals, referral services, and reservation services outranked all of the media-oriented information sources influencing lodging establishment selection, and the scale separations were significant.

3. The media-oriented scalar analyses of the familiar and unfamiliar groups indicate that those respondents who considered themselves familiar with the locations of lodging establishments in an area apparently considered credit card directories more important as an information source that did those respondents who were not familiar with the area. The familiar group apparently utilizes commercial billboards and broadcast media (radio and television) to a lesser degree than does the group not familiar with locations of lodging establishments.

4. Of the media-oriented items, physical appearance of the establishment is ranked first by the familiar and not familiar groups. The information source official highway signs retains the same rank for the group reporting familiarity but is discriminally less distinct.

5. When the set of ten media and non-media-oriented information sources and cues are scaled for the familiar and not familiar groups, a comparison reveals that the following sources and cues have the same ordinal rank within the scales: (a) reservation services, (b) commercial billboards and signs, (c) credit card directories, and (d) official highway signs (federal and state).

SIGNIFICANT CONCLUSIONS

1. The cost to motorist travelers of the removal or transfer of highway advertising information signs of lodging establishments from primary and Interstate highway systems, especially in rural areas, appears to be minimal based on the scalar analyses of media and non-media-oriented information sources and cues influencing choices of lodging establishments. Apparently the loss of information will not be significant to the motorist traveler if his conscious judgment of rank order and relative importance reflect an ability, possibly a willingness, to substitute or to intensify the use of other information sources and cues.

2. The sigma values and ranks of highway advertising signs in the scales reveal that other factors or sources of information are considered to be much more important to the motorist traveler in his efforts to identify and locate lodging establishments. The analyses do not suggest that commercial billboards and signs are not used or are not of some importance to motorist travelers. These signs do provide specific directions to lodging establishments for motorist travelers and hence have value. But if physical appearance of the lodging establishment and previous experience are as significant to the motorist traveler as they appear to be in selection of lodging establishments, then other types of signs such as an official highway sign with more information or near-highway information panels can serve the same purpose.

3. Other means of advertising might serve to influence more effectively the motorist traveler in his choice of lodging establishments. For example, the importance of the physical appearance of the establishment and previous experience as information sources to the motorist traveler suggests that selected kinds of print media might be more effective advertising tools. A study of the composition and amounts of advertising by lodging establishments would seem to be in order, not only to influence their

long-run success but also to provide a means of evaluating impact of external variables such as new highways, bypasses, and obviously highway beautification.

4. Analysis of information sources and cues reveals the rankings and importance of sources of information but does not indicate the total process by which the motorist traveler may or may not have judged the information sources and cues in selecting lodging establishments. The motorist traveler can avoid costs by pre-planning, and a preliminary evaluation of the importance of the rankings and levels of information sources and cues can be obtained by measuring where in space the motorist traveler made the decision to stop for lodging. If, for example, the decision was made before the trip began, the importance of highway signboards, or in fact many of the so-called media-oriented sources and cues, might require reevaluation. More than 52 percent of the respondents indicated that the decision of where to stop for lodging was made at the start of a day's trip or before. More than 47 percent of the respondents not familiar with the area indicated that they made a lodging-stop decision at the start of a day's trip or before, while almost 63 percent of the familiar group of respondents indicated that they made a lodging-stop decision at the start of a day's trip or before.

5. The suggestion that expenditures might be redirected or reallocated does not mean that outdoor advertising can be or should be eliminated. Although a complete answer cannot be given at this time, apparently the outdoor medium is a necessity to motels since direction and distance information is usually included on a signboard. More importantly, there is a significant contribution made to the motel firm which goes beyond merely locating the establishment for the motorist traveler. The consumer's perception of a specific motel's offering is reinforced, and the consumer may be influenced to select a specific motel.

6. To a large extent motorist travelers apparently are habituated in their use of commercial billboards and signs, and have limited perceptions of outdoor advertising and alternative means of advertising and promotion. In one sense it can be suggested that the use of outdoor advertising, which is designed as an information source and cue, may represent the best advertising medium, but other media might be utilized more effectively today. If the outdoor medium and the motorist traveler are victims of habit, then what is needed may be new designs and messages which can influence the motorist traveler as well as provide information for him.

ACKNOWLEDGMENT

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Public Attitudes Toward Transport Modes: A Summary of Two Pilot Studies

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This paper summarizes attitudinal research conducted over the past three years by a University of Maryland research team. Objectives were (a) to identify and assess the importance of attributes of an ideal transportation system by measuring consumer attitudes, and (b) to determine how satisfied these consumers are with existing systems in terms of these attributes. A distinct finding of preference for private modes was identified, although substantial variability existed among the attributes studied. An interesting trichotomous response pattern evolved when data were distributed and analyzed along demographic and trip characteristic dimensions.

•DURING the past three years, a research team at the University of Maryland has conducted two studies of consumer attitudes toward transport modes used for typical recent trips. These studies have attempted to partially fill a void existing in transportation research. Most transportation behavior research had been of the origin-destination variety (1, 2, 3), with detailed description of traveler, mode and trip purposes. Thus, much was learned about where people traveled, but the motivation for their behavior remained undisclosed.

A few studies have, however, been undertaken which have partially focused on consumer attitude measurement, thereby reflecting on consumer values relevant to transportation selection decisions (4, 5, 6, 7).

Although in most cases these efforts achieved their stated objectives, many had several limitations which precluded generalization of their results. One of the most severe was the small selected samples used. Another has been the narrowness of focus in terms of the modal, trip and/or user characteristics studied. The latter made it difficult to compare and contrast results between studies due to the different variables included in each. In some cases the method of collecting data had not been carefully constructed and/or evaluated. Finally, the designs of these studies were based on the proposition that the researchers knew which modal characteristics to study and how to define them. Usually abstract factors such as "convenience, comfort, status, congestion, flexibility, and expense" have been used as inputs in these studies. Such factors are lacking in precise definition and probably diffuse connotations for different people, making it difficult to measure them.

OBJECTIVES AND FOCUS

This paper describes two pilot studies conducted in Baltimore, Md., and Philadelphia, Pa., under contract with the Bureau of Public Roads. The primary emphasis is, however, on the Philadelphia study since the results of the Baltimore study were included in a previous paper by Hille and Martin (8). These studies attempted (a) to identify and assess the importance of attributes of an ideal transportation system by measuring consumer attitudes, and (b) to determine how satisfied these consumers are with existing systems in terms of these attributes.

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The Maryland studies have focused on the development of factor definitions empirically by subjecting a comprehensive pool of specific items reflecting particular travel characteristics to the statistical tool of factor analysis. Factors which emerge from this type of analysis are unique in that (a) they are defined by the specific items included within them which are found to be closely interrelated, (b) the extent to which such factors are independent of other factors is precisely established, and (c) probably most importantly, the definition of the factors is largely determined by the respondents as reflected by the interrelationship between their item responses, rather than by the researcher who assumes his definition is the same as the respondents. (Selectivity was, however, used in developing the comprehensive pool of items for the questionnaire.) It was thus hoped that the studies would result in progress toward a definition and classification of the attributes or factors perceived by transport users to be independent and important variables for determining their travel behavior.

Another research goal was to provide a more comprehensive coverage of significant variables affecting modal choice decisions than had previously existed. Models derived in other studies had only a modicum of success for predicting modal split decisions, probably because these decisions are more complex than they were originally thought to be. As few as two variables have been used (travel time and cost) to try to predict modal choice, and many studies included from four to six variables. Results of these studies suggest that the development of a valid prediction model for modal choice decisions depends upon the incorporation of several factors into the prediction milieu, and the sensitivity of the model to the complex interrelationships existing among factors.

The Maryland pilot studies attempted to develop an exhaustive pool of items tapping all salient attributes thought to affect modal choice decisions. Questions were incorporated to measure the importance of modal attributes as well as perceived satisfaction of respondents with public and private modes for these same attributes in the Philadelphia study. Responses to these items were related to a comprehensive set of trip purpose, demographic, and trip characteristic variables to provide a comprehensive picture of these determinants of modal choices.

The Maryland research studies also focused more heavily on determining the why of consumer behavior than had preceding transportation research. As previously stated, modal split research concentrated on what people did and their related demographic variables. The attitude instrument developed in the Maryland studies sought to determine what they did and why. The measurement approach used in this study, containing measures of both the importance of and satisfaction with modal attributes, is considered by many psychologists as the best available approach to attitude measurement. The importance of a particular attribute is a function of both the underlying strength of the human need or needs to which it is related, and its present satisfaction level. Thus, inclusion of satisfaction items with the importance items sought to clarify the extent to which the importance of an attribute is a function of its present level of satisfaction.

Finally, this research sought to provide some evidence about the reliability and usefulness of transportation attitude studies by comparing expressed attitudes with actual behavior. Information was collected about modes actually used for recent trips, and availability of these modes for such trips so that the consistency of expressed attitudes could be checked against what respondents said they actually did.

RESEARCH DESIGN

The design of the Maryland studies is reflected in ten questions for which answers were sought.

1. What are the most important trip purpose categories for which consumers have different preferences for attributes of transport modes?
2. What attributes do consumers regard as salient in typical recent trips?
3. What is the relative importance of the attributes for each trip purpose?
4. What is the perceived relative importance of the attributes in the aggregate (for all trip purposes)?
5. To what extent, and how, are demographic characteristics of respondents and trip characteristics related to the importance of trip mode attributes?

6. To what extent do consumers perceive themselves as being satisfied with the attributes of commonly used and available modes?
7. What is the relative frequency of use of existing modes for each trip purpose?
8. What is the availability of alternative modes for each trip purpose?
9. How do existing modes compare to the ideal, and to each other, in both a general sense and for each trip purpose?
10. To what extent, and how, are demographic characteristics of respondents and trip characteristics related to perceived satisfaction of trip mode attributes?

Review of relevant literature and current conceptualizations about consumer demand for transportation suggested that the characteristics of an ideal transport system, their relative importance, and consumer satisfaction with them might well differ substantially depending on the purpose of the trip being undertaken. For example, as an attribute of an ideal transport system, the importance of speed would most likely be a function of the time constraints or urgency of the trip purpose. Consequently, there was considerable theoretical support for the contention that there might not be any single "ideal system," but perhaps several "ideals," one for each significantly different trip purpose. Thus, it was considered necessary to investigate this issue in depth in the design of the study.

Question 1, concerning the identification of trip purposes, arose out of the early recognition that the importance of attributes might differ significantly as trip purposes varied. An original pool of 15 trip purposes was reduced to 4 for the Baltimore study and to 2 for the present study as a result of several pretests and the Baltimore study. Questionnaire time and space limitations also made this reduction imperative. The two remaining categories (trip to work—or school and in-town, non-work trip) were retained since they include the vast majority of in-town trips taken by transport users and were shown to have substantially different response patterns in the Baltimore study.

Question 2, which pertains to the attributes used by consumers in modal choice decisions, was essentially the heart of the Baltimore study and was studied further in Philadelphia. Thus, an effort to replicate, elaborate and extend the Baltimore results to Philadelphia was made. The original Baltimore item pool was, however, substantially reduced in number and several items were added to replace those found to be weak in the Baltimore analyses.

The justification of including Question 3 was nearly identical to that for Question 1. The significance of trip purpose for mode selection should be indicated basically by the frequency and magnitude of differences identified between the trip purposes for both studies.

Question 4 relates to the aggregative importance of the attributes across trip purposes which evolved as a primary issue in the Baltimore study. If important differences between trip purposes are small, it is feasible to think in terms of a generalized ideal transport system without need for trip purpose individuation. The Baltimore study results provided more justification for a generalized scheme than was originally expected. Philadelphia data were analyzed to determine if corroborating evidence existed.

Question 5, which analyzes the relationship of demographic and trip characteristics to the importance of the transport attributes, resulted from the recognition that responses might differ for diverse trip purposes, and also among unlike respondent categories. Results obtained in Baltimore supported this conclusion. For instance, urban residents had different response patterns than suburbanites.

The unique contributions of the Philadelphia study began with the collection of data relevant to Question 6. After the attributes were identified and their importance assessed, transport users' satisfaction with present facilities was analyzed. This information is pertinent for determining the desirability of improvements for present and future transport systems. These changes would hopefully increase consumer satisfaction and utilization of the facilities.

Questions 7 and 8 were included for the following reason: An existing problem in interpreting attitude surveys involves responses to questions that reflect actual versus predicted behavior of people. Questions 7 and 8 provide a partial internal check on this issue. For example, if a respondent states that: the attribute "self esteem" is not important for the work trip modal selection decision (Question 3); he takes the bus to work

(Question 7); he owns an automobile which sits idle while he is at work (Question 8); and he indicates the bus is lower in status satisfaction than the auto, attitudes and behavior are consistent. Although such perfect consistency could not always be expected, this type of internal check was provided in the design of this study.

The answer to Question 9 provided information about the relative merits of existing modes by evaluating consumer satisfaction levels. Comparisons of existing facilities to an "ideal" mode for each trip purpose are also facilitated.

Finally, the rationale for including Question 10 was similar to that explained for the admission of Question 5. It was thought that satisfactions of respondents might differ significantly in relation to demographic characteristics and more specific trip characteristics.

DEVELOPMENT OF THE QUESTIONNAIRE

A questionnaire consisting of three parts and a household information cover sheet was used to collect the Philadelphia data. (There were two questionnaires; the questions remained the same but their order was varied to control halo and positional ef-

TABLE 1

SELECTED CHARACTERISTICS OF SAMPLED INDIVIDUALS RESIDING WITHIN THE PHILADELPHIA SMSA (1967) AND BALTIMORE SMSA (1966): A COMPARISON WITH 1960 CENSUS REPORTS

Category	Total Philadelphia SMSA				Total Baltimore SMSA			
	Census		Sample		Census		Sample	
	Number	Percentage[a]	Number	Percentage[a]	Number	Percentage[a]	Number	Percentage[a]
Status of Person:								
Head[b]	1,266,429	30.1	228	48.4	484,980	29.1	166	35.9
Non-Head[c]	2,939,827	69.9	243	51.6	1,183,638	70.9	296	64.1
Total	4,206,256	100.0	471	100.0	1,668,618	100.0	462	100.0
Sex:[d]								
Male	1,446,358	47.9	196	41.6	567,026	48.5	162	35.1
Female	1,571,325	52.1	275	58.4	601,284	51.5	300	64.9
Total	3,017,683	100.0	471	100.0	1,168,310	100.0	462	100.0
Age:[e]								
16-20 years	286,883	9.5	29	6.2	116,822	10.0	62	13.4
21-24	203,430	6.7	33	7.0	85,280	7.3	26	5.6
25-34	568,452	18.8	91	19.3	236,279	20.2	91	19.7
35-44	634,320	21.0	69	16.5	255,112	21.8	116	25.1
45-54	526,075	17.4	110	23.4	198,981	17.0	89	19.3
55-64	401,357	13.3	64	13.6	143,892	12.3	43	9.3
65¼ over	397,163	13.2	55	11.7	131,944	11.3	33	7.1
Omission							2	.4
Total	3,017,663	100.0	471	100.0	1,168,310	100.0	462	100.0
Education:[f]								
Less than 8 years	592,506	18.9	34	7.2	326,511	26.8	62	13.4
8 & 9	787,717	25.1	58	12.3	296,612	24.3	64	13.8
10 & 11	546,441	17.4	103	21.9	190,524	15.6	89	19.3
12	773,625	24.6	193	41.0	249,700	20.5	137	29.6
13-15	222,915	7.1	41	8.7	81,557	6.7	55	11.9
16	132,887	4.2	24	5.1	45,163	3.7	28	6.1
Over 16	82,374	2.6	9	1.9	28,638	2.3	18	3.9
Omission			9	1.9			9	1.9
Total	3,138,465	100.0	471	100.0	1,281,961	100.0	462	100.0
	10.6		11.2		9.9		11.1	
Race:[g]								
White	2,626,698	85.3	370	78.3[h]	951,116	79.7	372[i]	80.5
Non-White	450,912	14.7	101	21.7	242,638	20.3	65	14.1
Omission							25	5.4
Total	3,077,610	100.0	471	100.0	1,193,752	100.0	462	100.0

[a] Percentages are rounded to the nearest tenth; therefore, in some instances, they may not total 100.0 percent.

[b] In the census and in the sample, the member reported as the head of the household by the respondent is the head of the household; however, for census tabulation only, if a married woman living with her husband is reported as the head, her husband is classified as the head.

[c] Non-head includes wife, child, other relative, and non-relative reported as part of the household.

[d] Includes only those people 16 years or older.

[e] In the census data, the age classification is based on the age of the person in completed years as of April 1, 1960, as determined from the reply to a question on month and year of birth. In the sample, ages are as reported by respondents.

[f] Census figures show the number of years of school completed for all those persons of 14 years of age and over.

[g] Census figures include all those persons over 14 years of age.

[h] In the Philadelphia study, the interviewer made a determination at the time of the interview as to each person's race.

[i] No determination as to a person's race was made by the interviewer. If a person resided on a block of at least 65 percent one race (as determined by the 1960 Census of Population and Housing), he was classified as being of that race. Thus, the 25 omissions occurred because certain blocks were not 65 percent one race.

Sources: 1. U. S. Census of Population and Housing: 1960, Final Report PHC(1)-116 (for Philadelphia) and PHC(1)-13 (for Baltimore) Standard Statistical Areas, Tables P1, P2, H1. 2. U. S. Census of Population: 1960, Vol. I, Part 22 (for Maryland) and Part 40 (for Pennsylvania), Characteristics of Population, Table 103.

fects.) Part A contained a set of questions designed to elicit descriptive information about the two trip purposes asked about in Parts B and C of the questionnaire, i.e., the respondent's last common or usual trip to work or school, and his last common or usual in-town, non-work trip. Part B included a set of 35 items measuring the importance of attributes contained in the items along a 7-degree Likert-type interval scale, ranging from "not at all important" to "of greatest importance." These items were designed to measure independent attribute factors, many of which were suggested by results obtained in the Baltimore study.

Part C contained a set of 33 items constructed to determine satisfaction with the Part B attributes for auto and the respondent's most likely form of public transportation for both trip purposes. The attributes included in Part B, but eliminated in Part C, were "the opportunity to drive the vehicle yourself" and "the opportunity to ride in your own vehicle." It seemed inappropriate to ask respondents to rate their satisfaction with these two attributes for public transportation. This questionnaire was designed to be self-administered, although the interviewer was available for any needed help.

SAMPLES

The selection of Baltimore and Philadelphia for study was based on several considerations. The two main reasons were: (a) both cities were within a reasonable distance of the University of Maryland which facilitated control and reduced data collection expenses; and (b) there were significant differences between the cities in terms of their transport systems, size, and demographic composition. Diversity was sought to measure the effects of such differences on consumer attitudes. For example, Baltimore's only form of public transportation is the bus, whereas Philadelphia has one of the most sophisticated public transit systems in the United States. Further, the population of Philadelphia 1960 SMSA is larger (4.4 million) than Baltimore's (1.7 million), thereby providing an indicator of attitude differences related to size of the area being studied.

The composition of the Philadelphia sample is summarized along selected social and economic characteristics in Tables 1 and 2. In addition, the tables present census data classified in the same manner as that of the Baltimore SMSA sample selected for Phase I.

The data in Table 1 concerning the age, education, sex, head/non-head of household and race composition of the sample and population are presented on an individual basis. In comparing sample data with census data for individuals, the reader is advised to proceed with caution since the sample was drawn from a universe of occupied housing units rather than a universe containing all individuals within the SMSA. Thus, it would not be expected that the proportions would be exactly identical for dissimilar universes. However, some information about the representativeness of the sample is provided with such a comparison.

Keeping that proviso in mind, the data in Table 1 indicate that the sample may be somewhat unrepresentative.

The greatest divergence appears in the distribution of the education characteristics. The sampled individuals seem to be those with higher educational attainments than the general public. Such differences may, however, be more apparent than real. The census data include individuals 14 years of age and over while the sample contains only people aged 16 and over. It is in the categories of less than 8 and 8 to 9 years of education where the sample seems to be under-represented (this contains the 14 to 15-year-old group). Further, the sample distribution is concerned only with those who participated in the study, not with every member of a family. Therefore, the selection limitations place an upward bias upon the distribution, and this is reflected in the findings of the median years completed of 11.2 for the sample compared to 10.6 in the total population.

The table also indicates that the sample may have a disproportionate number of females. That is, expected proportions would be a little closer to 50 percent females than the actual proportions of 42 percent male and 58 percent female. Special efforts were made in this phase of the study to include men in the sample since the analysis of Baltimore data showed some differences between male and female importance ratings. Comparison of proportions obtained in the two cities reveals some improvement in Philadelphia.

TABLE 2

SELECTED CHARACTERISTICS OF SAMPLED HOUSEHOLDS[a] CONTAINED WITHIN THE PHILADELPHIA SMSA (1967) AND BALTIMORE SMSA (1966): A COMPARISON WITH 1960 CENSUS REPORTS

Category	Total Philadelphia SMSA				Total Baltimore SMSA			
	Census		Sample		Census		Sample	
	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Ownership:								
Owned[b]	885,788	70.0	258	71.5	308,720	63.7	250	71.8
Rented[c]	380,641	30.0	100	27.7	176,260	36.3	95	27.3
Omission			3	.8			3	.9
Total	1,266,429	100.0	361	100.0	484,980	100.0	348	100.0
Income:[d]								
Under $1,000	33,790	3.1	5	1.4	15,183	3.6	2	.6
1,000- 1,999	47,239	4.3	12	3.3	20,035	4.7	11	3.2
2,000- 2,999	60,571	5.6	27	7.5	26,082	6.2	16	4.6
3,000- 3,999	84,381	7.8	21	5.8	36,296	8.6	16	4.6
4,000- 4,999	115,875	10.6	28	7.8	47,486	11.2	22	6.3
5,000- 5,999	144,753	13.3	48	13.3	56,755	13.4	48	13.8
6,000- 6,999	132,080	12.1	56	15.5	49,641	11.7	44	12.6
7,000- 9,999	260,686	24.0	77	21.3	97,893	23.1	77	22.1
10,000-14,999	145,442	13.4	64	17.7	52,159	12.3	62	17.8
15,000-24,999	46,281	4.3	18	5.0	16,011	3.8	50	14.4
25,000 and over	16,398	1.5	2	.6	5,939	1.4	0	0
Omission			3	.8			0	0
Total	1,087,496	100.0	361	100.0	423,480	100.0	348	100.0
Median income	$6,433		$6,700		$6,199		$7,440	
Number in household:[e]								
1 Person	162,111	12.8	27	7.5	55,893	11.5	14	4.0
2 Persons	335,237	26.5	107	29.6	125,765	25.9	74	21.3
3 Persons	248,879	19.7	68	18.8	96,590	19.9	86	24.7
4 Persons	237,308	18.7	69	19.1	89,541	18.5	81	23.3
5 Persons and over	282,894	22.3	90	24.9	117,191	24.2	93	26.7
Total	1,266,429	100.0	361	100.0	484,980	100.0	348	100.0

[a] A household consists of all the persons who occupy a housing unit.

[b] In the census data, a housing unit is owned if the owner or co-owner lives in the unit, even if it is mortaged or not fully paid for.

[c] All other occupied units are classified as rented in the census figures.

[d] Income is given in the census data on a family basis, and in the sample data on a household basis.

[e] All persons enumerated in the 1960 Census of Population as members of the household were counted in determining the number of persons who occupied the housing unit. These persons include any lodgers, foster children, wards, and resident employees, who shared the living quarters of the household head. The same method was used in the sample.

Sources: 1. U. S. Census of Population and Housing: 1960, Final Report PHC(1)-116 (for Philadelphia) and PHC(1)-13 (for Baltimore) Standard Statistical Areas, Tables P1, P2, H1. 2. U. S. Census of Population: 1960, Vol. 1, Part 22 (for Maryland) and Part 40 (for Pennsylvania), Characteristics of Population, Table 103.

In contrast to Table 1, the data in Table 2 are presented with household units as the base. Again, the reader is cautioned about making direct comparisons between sample characteristics and census data. It seems probable that changes would have occurred in the population during the interval between the undertaking of the 1960 Census and the gathering of the sample data.

Generally speaking, the distributions of the Philadelphia sample appear representative for the observed characteristics. The proportion of one person households may be a little lower than in the population, which probably accounts for the under-representation of the two lowest income categories in the sample.

When viewing these data it should be recognized that the chief objective of this phase of the project was to obtain a sample that included enough units of differing socio-economic characteristics to allow analysis of their questionnaire responses. That is, the primary goal was to discover if observed differences in responses to the importance and satisfaction sections of the questionnaire were partially attributable to variability in social and/or economic conditions. Thus, the precision of any generalization about the Philadelphia SMSA was an important, but clearly secondary, consideration in the overall project design. The sample is satisfactory in terms of the primary requirements. The findings of the study do point out differences in social or economic characteristics of the sample items in relation to attitude item responses.

ANALYSIS

A variety of analytical techniques were applied to the data developed for the Philadelphia study. The previously stated research questions provided the central structure

for the selection of the appropriate analytical tools. Of principal interest were the factor analyses of responses to Parts B and C (attitude sections) of the questionnaire.

Factor analysis of the Baltimore data yielded an empirically derived list of attribute factors which were subsequently labeled according to their apparent underlying dimension. The Baltimore research was concerned only with the importance of attributes to consumers; that in Philadelphia inquired into importance and satisfaction. However, this same analytic technique was used for the Philadelphia "importance" and "satisfaction" data. The factor analyses of importance items for each trip were made for the Philadelphia data in order to determine if the factors identified in Baltimore would be replicated in Philadelphia. Further, as a few new items were developed after the completion of the Baltimore research, it was necessary to determine if these items would cluster into new factors.

Simple frequency and percentage distributions, means, standard deviations, and standard errors were used in condensing and analyzing other relationships in the data.

Reliability

Various versions of the questionnaire have been subjected to test-retest reliability studies over a time span of approximately two weeks. These studies were made to insure that the instrument would elicit a stable response. Reliability is necessary if the results are to have validity and practical value. If responses are ephemeral, either because the variable being measured changes frequently or because the instrument is ambiguous, confidence in the responses and usefulness of them would be questionable.

Subjects used in these studies have been University of Maryland freshmen. Although coefficients of reliability have been obtained on an item-by-item basis, the most relevant set of coefficients are for the basic factors or attributes identified in factor analysis of item matrices. These factors are composed of from 2 to 8 items found to be highly interrelated. Table 3 gives the range and median of 6 coefficients obtained for 8 factors and a set of miscellaneous items which did not cluster into a factor) in the most recent liability study of the final version of the questionnaire in the Philadelphia study.

The six coefficients represent the results of relating responses to three parts of the questionnaire to each of two trip purposes. The three parts include (a) importance responses, (b) satisfaction with auto responses, and (c) satisfaction with public transport responses.

Three conclusions appear warranted. First, in light of the median coefficients, minimum levels of reliability are attained in most cases. Second, the range of coefficients suggests that some facets of the questionnaire are still not eliciting adequate levels of consistency (especially satisfaction responses to the non-work trip). Third, although these levels of reliability are acceptable for the experimental pilot studies, before the questionnaire is administered on a large scale, it should be pruned and refined again and then tested on a more realistic sample of the public than college freshmen.

TABLE 3

TEST-RETEST RELIABILITY COEFFICIENTS FOR EACH OF 9 FACTORS[a]

Factor	Range of 6 Coefficients	Median Coefficient[b]
Reliability	0.42-0.91[c]	0.75
Weather	0.18-0.84	0.69
Travel time	0.62-0.85	0.77
Cost	0.42-0.85	0.71
State of vehicle	0.49-0.89	0.73
Self-esteem	0.51-0.97	0.80
Diversions	0.42-0.92	0.81
Unfamiliarity	0.53-0.92	0.77
All other items[d]	0.62-0.91	0.77

[a] N = 53 University of Maryland freshmen with a 14-day interval between administrations.
[b] Since there are six coefficients, the median is the average of the third and fourth highest coefficients.
[c] For some reason, the reliability for satisfaction with factors on the non-work trip was much lower than for the other five sets of coefficients. It may be there was a mistake in the output, but it could not be found with a check.
[d] Items 6, 7, 16, 17, 19, 25, 26, 27.

Validity

Although the results of these two studies do not provide any conclusive evidence about the validity of the instrument, two particular parcels of information were obtained which supports its validity. The first concerns a comparison of results obtained in Baltimore and Philadelphia. The extent to which comparable results are replicative has some bearing on the instrument's validity. Second, the Philadelphia study was designed so that it would be possible to determine the relationships between expressed respondent attitudes and modal use behavior. The congruence of expressed attitudes and respondent behavior also partially reflects validity.

Comparison of Baltimore and Philadelphia Results

Summary evidence presented in Table 4 suggests that factors emerging in both Philadelphia and Baltimore studies were quite comparable, in spite of some material differences. Difficulty is encountered in trying to assess the reasons for these differences, because they could be caused by one or more of the following circumstances. First, and most importantly, about one-third of the items in the two questionnaires were different. The least significant and most ambiguous Baltimore items were discarded to maintain a reasonable length while adding the satisfaction section to the Philadelphia questionnaire. Furthermore, several new items were added to improve the measurement of factors emerging in Baltimore and to uncover any new factors not measured by the Baltimore questionnaire. Second, it may be that Philadelphia respondents actually do perceive the factors differently from Baltimore respondents; that is, perhaps differences are a function of true attitude rather than a reflection on the validity of the questionnaire. Third, error variance in the questionnaires may be a contributing factor. Finally, differences in interpretive judgments of the factors by the researchers may be accounted for a portion of the difference. It should be remembered that the titles of the factors are purely a function of researcher judgment and a more relevant consideration for readers may be a comparison of factor item compositions and loadings from the appropriate factor analysis tables of the two studies.

Factor titles in Table 4 are presented in rank order of importance so that it is possible to determine differences between studies in factor importance as well as for the definition of the factors themselves.

Comparisons of the factor matrices for Baltimore and Philadelphia, for both work and non-work trips, show that four factors (identified as reliability, travel time, cost, and age of vehicle or state of vehicle) are defined by similar terms. Most of the other Baltimore factors merged into slightly broader or narrower factors in Philadelphia. For example, the independence of control factor (independent of anyone, control speed and direction) from the Baltimore study broadened into a self-esteem factor (independence, satisfaction of owning, pride of ownership, etc.) as a result of the inclusion of items pursuing that line in the Philadelphia questionnaire, and the Baltimore no repairs unique factor is included in the reliability dimension by the Philadelphia respondents.

It is concluded that considerable similarity exists between the dimensions identified empirically in the Baltimore and Philadelphia samples. Most differences which do exist,

TABLE 4

COMPARISON OF BALTIMORE AND PHILADELPHIA FACTORS IN ORDER OF IMPORTANCE

Work Trip		Non-Work Trip	
Baltimore	Philadelphia	Baltimore	Philadelphia
1. Repairs	1. Reliability	1. Repairs	1. Reliability
2. Reliability	2. Travel time	2. Comfort	2. Weather
3. Speed	3. Weather	3. Cost	3. Convenience
4. Cost	4. Cost	4. Speed	4. Cost
5. Independence	5. State of vehicle	5. Independence	5. Travel time
6. Traffic	6. Unfamiliarity	6. Family and friends	6. State of vehicle
7. Age of Vehicle	7. Self-esteem	7. Traffic	7. Congestion
8. Family and friends	8. Diversions	8. Age of vehicle	8. Unfamiliarity
			9. Diversions
			10. Self-esteem

can be explained by the different item content of the two questionnaires. It is anticipated that one additional modification and refinement of questionnaire items should result in the achievement of as independent and comprehensive a set of attributes as reality will permit. With regard to the latter consideration, one reason the factors do not come out entirely pure may be, because the consumers themselves do not perceive the items associated with those factors to be independent. For example, convenience and travel time may be conceptually distinct attributes, but it is obvious they are not entirely independent. To determine precisely how closely the importance of the items response patterns coincided between the two cities, a correlation analysis was made for the 21 importance items which remained the same for both questionnaires. Pearsonian coefficients were obtained between the item means. Recognizing that this procedure always overstates the magnitude of the relationship between correlated variables the relationships are still high, i.e., for trip purpose one, the correlation between the means was 0.90, and for trip purpose two it was 0.99. However, there were several interesting and significant differences between the two cities for specific trip and demographic characteristics. For example, bus riders in Baltimore showed a distinct tendency to regard reliability, convenience, comfort, and cost as more important than did auto riders. This tendency was not replicated in Philadelphia, perhaps reflecting a higher quality service in the latter city.

Attitude Compared to Reported Behavior

Attitude studies are frequently criticized as being of questionable validity, because they fail to demonstrate a linkage between attitude responses and actual behavior of respondents. Since transportation policy-makers are interested in understanding, predicting, and if possible, influencing behavior of transport users, they too should be interested in the association between attitudes and behavior of respondents in this study. Thus, expressed attitudes about the importance of, and satisfaction with, transport attributes were compared to modes reported as actually being used on a recent work or non-work trip. The reader is cautioned, however, to remember that the results are based on small subsamples and may be inaccurate. Only those respondents who reported having another mode reasonably available are included in this analysis.

Analysis of mode use and attitudes for the work trip supported the following conclusions:

1. Those who took automobile reported more satisfaction with auto than did those who took public transport.
2. Those who took public transport reported more satisfaction with public transport than did those who took auto.
3. Public transport riders report slightly more satisfaction with public transport modes than with auto for the most important reliability of destination achievement factor.
4. For two other important factors (travel time and cost), public transport users saw little difference in satisfaction between auto and public modes. However, for the important weather factor, they rated auto more satisfactory.
5. Auto users rated auto substantially more satisfactory on the self esteem, diversions, and unfamiliarity factors than did public transport riders.
6. Considering items rather than factors, the public transport group rated public modes as more satisfactory than auto on only 6 of the 33 items.

Evidence accumulated for the non-work trip suggests the following conclusions:

1. Those using automobiles report higher satisfaction with the auto than do those using public modes.
2. Those taking public transit rate auto as more satisfactory than public transit for all factors (but less than do auto users) and for all but one item.

These results suggest a modest positive linkage between expressed attitudes and reported behavior, particularly for the work trip. An issue of crucial importance for the interpretation of this evidence is how respondents perceived the question of whether a mode other than the one they used was reasonably available. If public mode users viewed it as meaning that an auto or other vehicle was possessed by the family, but not necessarily

readily available for their particular trip, then they may be more of a captive group than their surface responses would suggest. Further research about linkage is required before clear conclusions can be drawn.

FINDINGS

Remembering the previously described sampling limitations and the tentative nature of findings based on small pilot studies, the following points emerge as the most important findings of the two studies.

Trip Purpose Distinctions

Evidence indicative of the relationship between the work and non-work trip purposes for the importance section is given in Table 5. As was true in Baltimore, the main difference between them appears for the travel time factor, it being more important for the work trip. In addition, items embodied in factors labeled convenience and congestion clustered together into relatively independent dimensions for the non-work trip only. Some of the items were related quite highly to travel time items for the work trip, and are found in that work trip factor. It is concluded that differences between the item content of factors and the importance of the factors are great enough to warrant the continued distinction between work and non-work trips. However, it should be noted that 8 of the 10 factors emerged with similar item compositions for both trip purposes.

Attributes of Transport Modes

Ten factors emerged from the factor analyses, with eight of them fairly stable across both trip purposes. These dimensions closely paralleled factors identified in Baltimore considering differences in item content of the questionnaires. Factor analyses of satisfaction items also showed a similar pattern of factors, thus providing evidence of stability across both sections of the questionnaire.

It is concluded that the goal of a clearly defined exhaustive set of relatively independent and stable factors salient to modal choice decisions has not been fully attained. However, progress in that direction certainly has been made. One implication of these results is that models attempting to predict consumer behavior will probably have to include more than the 2 to 4 factors they typically incorporated if high levels of predictive validity are to be attained.

Importance of Attributes by Trip Purpose

The main differences in attribute importance between trip purposes existed for the travel time, convenience, and congestion factors. Travel time was substantially more important for the work trips than for non-work trips (Table 5). The differences in the importance of convenience and congestion are clouded by the failure of these factors to emerge for both trip purposes. However, examination of factor analysis tables in the body of the report reveals that the ranking of third (3) for the convenience factor (non-work trip) coincides closely with the ranking of second (2) for the travel time factor (work trip). This is significant because the two items composing this factor ("avoid walking more than a block" and "avoid changing vehicles") fell within the travel time factor for the work trip. This evidence suggests the difference between the two trip purposes for convenience items was not larg-

TABLE 5

DIFFERENCES IN PHILADELPHIA FACTORS BETWEEN TRIP PURPOSES ARRANGED ON THE BASIS OF RELATIVE IMPORTANCE[a]

Factors	Trip Purpose	
	Work-School	Non-Work
Reliability	6.39(1)	6.34(1)
Travel time	6.14(2)	5.26(5)
Weather	5.99(3)	5.98(2)
Cost	5.50(4)	5.52(4)
State of vehicle	5.13(5)	5.10(6)
Unfamiliarity	4.62(6)	4.56(8)
Self-esteem	4.61(7)	4.25(10)
Diversions	4.01(8)	4.45(9)
Convenience	–	5.78(3)
Congestion	–	5.02(7)
Highest possible score: 7.00		

[a]Both the relative and absolute importance of the dimensions identified in the factor analysis for each trip purpose are summarized. Ranks are presented in parentheses and average importance is indicated on a 7-category interval scale.

Other data in the body (Tables 6 and 7) support this conclusion, although both items were slightly more important relatively for the non-work trip.

The congestion items did not fall into any factors for the work trip, but they did not differ in importance significantly between trip purposes.

Finally, it should be noted that, although there were few significant relative differences in the importance of factors between trip purposes, most factors were regarded absolutely more important for the work trip. This is not unexpected, since the work trip is more compelling in requiring reliable, rapid, convenient, low cost, etc., transportation.

It is concluded, that except for travel time, there are few significant differences between the trip purposes used in this study. However, as is often true when data are condensed into a few broad categories (in this case, factors), there is a need for more intensive scrutiny of the elements in the category before a clear picture emerges.

Importance of Attributes for an Ideal System

Since differences in the relative importance of attributes between trip purposes were slight, except for the travel time factor, it is concluded that it is feasible to discuss the attributes of a generalized ideal system. The following list of factors arrayed in order of importance suggests the basic attributes of such a system.

1. Reliability of destination achievement (including elements of safety and confidence in the vehicle);
2. Convenience and comfort;
3. Travel time (but with large trip purpose differences);
4. Cost;
5. State of vehicle (with cleanliness overshadowing newness);
6. Self esteem and autonomy (with emphasis on independence rather than pride);
7. Traffic and congestion (both in and out of the vehicle); and
8. Diversions (including nature of travel companions, availability of radio, and scenery).

This list and the terminology used in defining the factors reflect the influence of results obtained in both Philadelphia and Baltimore. The similarity of findings across the two studies is striking.

Relationship of Demographic and Trip Characteristic Variables to Importance of Transport Attributes

Data pertaining to these relationships suggest that a very interesting trichotomy of response patterns may exist with regard to attitudes relating to importance of, and satisfaction with transport attributes.

The group which ranks importance attributes highly appears to be those who live in the suburbs fairly close to the CBD, have one or more autos, high income, live in single-family homes, regard out-of-town trips as being from 16 to 40 miles, use the automobile heavily for both trip purposes, and are white. Thus, they appear to be the more affluent suburbanite with middle-class American value systems emphasizing status, independence, convenience, reliability, and speed of travel.

The two other groups in the trichotomy regarded most factors as less important than the above group, but apparently for different reasons. Those residing nearest to the CBD in multiple-family housing with lower incomes and educations, owning fewer autos, and composed heavily of minority groups rated most factors as less important. This could be due to several reasons including misunderstanding of the questionnaire, reluctance to admit that things not possessed are important, less need for and emphasis on transportation, and perhaps different values and needs than those of middle-class suburbia.

The third group lives farthest from the CBD and had several characteristics similar to the first group. However, they also rated several factors as less important than the former group. Some of their response patterns suggested the hypothesis that this group has purposely chosen residences far from the center of the city to get away from the

TABLE 6

PERCENTAGE DIFFERENCES BY ITEM OF AUTO SATISFACTION OVER PUBLIC MODES SATISFACTION FOR THE WORK TRIP

Rank by Mean Importance		Rank by Percentage Difference: Auto-Public Modes Satisfaction	Actual Percentage Difference: Auto-Public Modes Satisfaction	Item No.	Description
Rank	Mean		0 10% 20% 30% 40% 50%		
11	(5.83)	1		26	Avoid waiting more than 5 minutes
22	(5.10)	2		6	Uncrowded vehicle
9	(5.97)	3		5	Protected from weather while waiting
30	(3.87)	4		4	Listen to radio
23	(4.70)	5		19	Package and baggage space
5	(6.14)	6		12	Shortest distance
17	(5.48)	7		16	Avoid walking more than a block
16	(5.52)	8		14	Feel independent
33	(3.56)	9		8	Take along family and friends
7	(6.10)	10		17	Avoid changing vehicle
19	(5.28)	11		3	Cost
24	(4.70)	12		31	Pride in vehicle
27	(4.50)	13		23	People you like
10	(5.88)	14		1	Shortest time
6	(6.13)	15		24	Fast as possible
26	(4.55)	16		21	Friendly people
29	(4.07)	17		32	Avoid riding with strangers
13	(5.62)	18		27	Comfortable
31	(3.87)	19		9	Ride with people who chat
28	(4.11)	20		25	Need not pay daily
2	(6.40)	21		11	Arrive at intended time
14	(5.59)	22		13	One-way cost of $0.25 rather than $0
12	(5.66)	23		22	One-way cost of $0.25 rather than $0
15	(5.59)	24		10	Clean vehicle
25	(4.66)	25		20	New modern vehicle
18	(5.46)	26		29	One-way cost of $0.03 rather than $0
20	(5.17)	27		30	Avoid unfamiliar area
21	(5.14)	28		7	Travel when traffic is light
8	(6.01)	29		2	Vehicle unaffected by weather
3	(6.39)	30		18	Safest vehicle
1	(6.49)	31		28	Arrive without accident
4	(6.30)	32		33	Avoid stopping for repairs
32	(3.56)	33		15	Look at scenery

TABLE 7

PERCENTAGE DIFFERENCES BY ITEM OF AUTO SATISFACTION OVER PUBLIC MODES SATISFACTION FOR THE NON-WORK TRIP

Rank by Mean Importance		Rank by Percentage Difference: Auto-Public Modes Satisfaction	Actual Percentage Difference: Auto-Public Modes Satisfaction	Item No.	Description
Rank	Mean		0 10% 20% 30% 40% 50%		
14	(5.40)	1		26	Avoid waiting more than 5 minutes
4	(6.01)	2		5	Protected from weather while waiting
33	(3.46)	3		4	Listen to radio
20	(5.15)	4		6	Uncrowded vehicle
15	(5.33)	5		19	Package and baggage space
10	(5.58)	6		16	Avoid walking more than a block
16	(5.30)	7		12	Shortest distance
23	(4.82)	8		1	Shortest time
28	(4.48)	9		31	Pride in vehicle
17	(5.24)	10		3	Cost
31	(4.04)	11		32	Avoid riding with strangers
19	(5.18)	12		14	Feel independent
24	(4.75)	13		21	Friendly people
25	(4.67)	14		23	People you like
11	(5.58)	15		10	Clean vehicle
5	(5.99)	16		17	Avoid changing vehicle
9	(5.65)	17		27	Comfortable
29	(4.15)	18		9	Ride with people who chat
8	(5.67)	19		11	Arrive at intended time
26	(4.65)	20		8	Take along family and friends
18	(5.23)	21		24	Fast as possible
32	(3.79)	22		25	Need not pay daily
13	(5.53)	23		29	One-way cost of $0.03 rather than $0
27	(4.62)	24		20	New modern vehicle
12	(5.56)	25		13	One-way cost of $0.25 rather than $0
7	(5.74)	26		22	One-way cost of $0.25 rather than $0
21	(5.07)	27		30	Avoid unfamiliar area
22	(4.89)	28		7	Travel when traffic is light
1	(6.42)	29		28	Arrive without accident
6	(5.95)	30		2	Vehicle unaffected by weather
2	(6.34)	31		18	Safest vehicle
3	(6.27)	32		33	Avoid stopping for repairs
30	(4.04)	33		15	Look at scenery

congestion of urban living. They appear less status and ego oriented and presumably value the pastoral aesthetic environment highly. Thus, transport attributes are of importance to them only insofar as their lack interferes with the cultivation of their interests.

Satisfaction With Auto and Public Transport

If there is one startling finding emerging from this study, it would probably have to be the overwhelming preference which respondents expressed for auto over their most likely form of public transport. Tables 6 and 7 indicate that auto had a more favorable image than public transport on all 35 items in the questionnaire for both trip purposes, although the degree of favorableness varied substantially. Travel time, susceptibility to weather, self esteem and convenience-comfort were the factors for which the auto was perceived to be most satisfactory in comparison with public transport. Auto had less of an advantage for reliability, cost, state of the vehicle and diversions factors. In addition, the preferential attitude toward the auto was more pronounced for the non-work trip than for the work trip. Although part of this trend may have been due to a halo effect, it does not seem rational to attribute more than a minor portion of it to this possibility.

Comparison of Existing Modes to an Ideal

Based on previous discussions of importance and satisfaction, two conclusions are evident. First, the auto approaches the ideal much more closely than do existing public modes. The average responses for the factors along a 7-category scale ranging from "not at all satisfied" (1) to "completely satisfied" (7) were all close to "very well satisfied" (6). Congestion, cost and diversions were the factors for which the auto was perceived to be weakest in relation to the ideal. Public transport had average factor responses clustering around the "generally satisfied" category (5) with the majority between it and "somewhat satisfied" (4).

Second, it is evident that both modes are quite satisfactory with regard to the most important characteristic of an ideal mode (reliability of destination achievement), although auto also has a slight advantage for this factor. Apparently, the risk of having the vehicle break down or the fear of accidents is not great for these modes, and thus is not likely to be a crucial consideration in choosing between them on in-town trips. Whether this image also exists for out-of-town trips would be an interesting question for future research.

Relationship of Demographic and Trip Characteristic Variables to Satisfaction With Transport Attributes of Auto and Most Likely Public Mode

The trichotomous pattern found for importance responses was even more distinct for satisfaction responses. Generally, the most satisfied people were the middle-class suburbanites living fairly close to the CBD. They, of course, are the ones who possess one or more autos and find it most feasible and satisfying to use them for both trip purposes. Surprisingly, the low-income group living closest to the CBD was generally more satisfied than people living in the remote suburbs. Apparently, they have adjusted to a lack of auto in many cases and probably keep their trips short and to a minimum. The people farthest from the CBD were least satisfied, probably because their very location made traveling difficult and onerous. They tended to be relatively dissatisfied with all modes for most factors.

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