

# Public Attitudes Toward Automobile-Restricted Streets in Philadelphia and Trenton

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An evaluation of the effectiveness of automobile-restricted zones as a transportation system management strategy to improve mobility in activity centers is the subject of a study conducted in the Delaware Valley region. Attitudinal surveys were used to compare two automobile-restricted zones in the region: the Chestnut Street Transitway in Center City in Philadelphia and the Trenton Commons Mall in downtown Trenton, New Jersey.

Separation of pedestrian and vehicle traffic has been applied successfully in many European urban centers since the 1950s. It is only recently that the technique has gained popularity in the United States (1). The objective of automobile-restricted zones is to improve commercial vitality, environmental quality, and traffic conditions in urban centers. At the same time, they save energy by encouraging public transportation and nonautomobile modes of travel and create a safer and more relaxed atmosphere for pedestrians.

A review of the literature indicates that the general response to automobile restriction and pedestrian-transit improvements has been favorable. Nearly all participating cities have initially experienced a reluctance to participate in such programs, particularly from merchants but, after a period of experimentation, adaptation, and evaluation, a consensus of support is evident. Whenever aggressive programs have been pursued with public and private cooperation and involvement, the image of the downtown area is visually more pleasing and economically more viable (2).

The underlying hypothesis in this study is that the strategy of an automobile-restricted zone may have varying effects depending on the prevailing conditions. The mercantile composition and the economic vitality of the activity center, its perceived safety and relative accessibility, and the physical and operational design of the automobile-restricted zone have been identified as the critical independent variables.

The survey questionnaire was chosen as the most appropriate technique in view of the other available data. Results from a survey conducted among employees in the Chestnut Street Transitway area are compared with information provided by the city of Trenton that was gathered through an independent attitude survey of downtown employees. Another survey polled the Chestnut Street merchants and compared results with a pretransitway survey.

## CHESTNUT STREET TRANSITWAY

Center City in Philadelphia covers approximately 5 km<sup>2</sup> (2 miles<sup>2</sup>), represents the center of a nine-county region with a population of more than 5 000 000, and provides the focus of office, commercial, and cultural activity for 300 000 employees. Recent rehabilitation efforts have strengthened its vitality and increased its relative attractiveness.

Chestnut Street has always been one of the city's finest shopping streets. The main office building com-

plex around Broad Street and the historic monuments on the east end generate additional large volumes of pedestrian and vehicle traffic that create serious traffic congestion problems. The city of Philadelphia began actively to investigate the feasibility of the Chestnut Street Mall in 1956 (3). Although planners, elected officials, and large businesses with a stake in Center City's future were proponents of the mall, hundreds of small, prospering merchants were opposed to it. Planning for the Philadelphia bicentennial celebration revived interest in the mall idea and served as a catalyst to implementation.

In May 1975, Chestnut Street became the transitway. There were two-way bus operations between 18th and 6th streets, and other motor vehicles were excluded. Sidewalks were widened, and special fixtures such as lighting, trees, and various street furniture were added. The project cost \$7.4 million and was funded through a capital grant from the Urban Mass Transportation Administration (UMTA).

## Survey of Employees

A questionnaire was designed to collect data on employees' attitudes toward the transitway and the downtown area (4). The survey was limited to directly affected employees who work in the two-block area immediately adjacent to the transitway (Market to Walnut streets) from 18th Street to 6th Street. Of 15 000 questionnaires distributed to 141 firms during February 1976, 5285 completed questionnaires were returned.

The survey results show that there is common agreement that daytime pedestrian traffic on Chestnut Street has increased; however, there are no prior pedestrian counts to document this. More than 60 percent of respondents indicated that they walk and do more shopping on the transitway than on other streets. Twenty-two percent were influenced by the transitway to ride buses on Chestnut Street rather than other streets even though statistics show that, contrary to anticipation, transitway bus travel time has increased. Twenty percent of the respondents reported patronizing eating establishments on Chestnut Street more than on other streets.

The results of the employee survey suggest that the transitway was successful in accomplishing its indirect goals of improving the commercial vitality and environmental quality of Center City. An overwhelming majority (76 percent) of the respondents agreed that the transitway was successful in creating a more relaxed atmosphere for pedestrians. Sixty-six percent thought that the facility preserved or improved the commercial vitality of the city. Sixty-five percent also agreed that the transitway achieved its goal of improving the environmental and aesthetic quality of the city.

The main goals of the transitway planners were to improve traffic conditions downtown and to encourage public transportation. Fifty-two percent of the respondents said that traffic conditions improved, and 44 per-

cent agreed that the transitway encouraged the use of public transportation and nonautomobile means of travel. Combined with the fact that a relatively small portion of the respondents were influenced to ride public transportation on the facility more frequently, it appears that the transitway has not yet lived up to its transit expectations.

The strongest argument in favor is that there is common agreement among respondents (75 percent) that the transitway should not be opened to automobile traffic again. Provision for more parking facilities adjacent to the corridor was a popular recommendation: Sixty-one percent favored the measure, and 58 percent were opposed to the option of allowing private automobiles after working hours. Another interesting finding was that more than half of the respondents are against further restriction of automobiles on other downtown streets.

The responses to the other recommendation regarding restriction of use to pedestrians only was mixed. Lower income users, who are much more dependent on bus transportation, are against any restriction of bus traffic.

A feeling of dissatisfaction was communicated through the write-in recommendations on excessive bus speed between stops, reckless driving, and two-way operation, which was viewed as a potential hazard to pedestrians. The size and poor condition of buses as well as excessive noise and pollution levels were also subjects of complaint.

The attitudes of respondents toward Center City were very interesting. Eighty-nine percent of the respondents who commute to work use some form of public transportation. Forty percent of them do more than half of their shopping downtown and feel that one of the strongest advantages of Center City is that it offers a greater variety of merchandise. The lack of convenient and free parking was rated a very serious problem. As the distance of the residence from Center City increased, there was less enthusiasm about the advantages and more concern about the problems of the downtown area.

#### Survey of Merchants

Wearing apparel and miscellaneous retail businesses account for one-third of the 258 commercial establishments along the transitway. Eating and drinking establishments come next and are followed by banking and financial institutions. Eleven furniture and equipment stores, two department stores, two hotels, two movie theaters, and two parking garages and lots are scattered along the transitway. Most establishments tend to be small, employing 10 or fewer persons.

The closing of Chestnut Street to automobile traffic has had a great impact on the composition of commercial establishments along the street. New, nationally known chain stores have moved in and contributed to the economic stability of the downtown area while borderline shops have been forced out because of increased rents. The crowds on the street have attracted entertainers who perform on the sidewalks.

A survey of all merchants was undertaken to assess the effects of the transitway on customer accessibility, business activity, and deliveries. A successful personal distribution and collection of the questionnaires resulted in 72 percent of the forms being completed.

Seventeen percent of businesses moved in after the completion of the transitway, and only one-third of these considered the transitway a major factor in their location. About 3 of every 10 merchants generally felt that the transitway had prompted them to make changes or renovations in their stores.

More than half of the merchants surveyed expressed an overall favorable attitude toward the transitway, and

approximately one-quarter voiced an unfavorable comment. Overall, large businesses were more favorable than small establishments. The banking and financial institutions were 70 percent in favor. On the other hand, furniture and equipment stores, eating and drinking places, and miscellaneous retail stores were less favorable.

A telephone survey taken by Philadelphia '76 before construction of the facility reported approximately 80 percent of the 200 merchants who responded to be in favor of the project and 13 percent opposed. A comparison of the before and after responses of the same firms indicates that the implementation of the transitway has changed formerly favorable attitudes to indifferent or unfavorable. Evidently, the transitway did not meet the expectations of some merchants. About 60 percent of those merchants who are now unfavorable were once in favor.

Thirty percent of the merchants surveyed felt that business activity had increased since the opening of the transitway, another 30 percent felt it had remained the same, and 25 percent said it showed a decrease. Almost all those who indicated an increase in business also expressed a favorable overall attitude but were evenly divided as to the change being a result of the transitway. The majority of those merchants who indicated a decrease in business activity voiced an unfavorable attitude, and almost all of them attributed this change directly to the transitway. Business activity is very much a function of the type of business. Sales of wearing apparel increased, but eating and drinking places lost business.

The majority of the merchants responded that accessibility of customers to their stores had either become more difficult or at least had remained the same. Generally, stores that depend on pedestrian access felt there was an improvement in accessibility, and stores that depend on automobile accessibility seemed to be negatively affected. Several merchants, especially small, miscellaneous retail stores, felt that the automobile traffic during night hours provided shoppers with a sense of security that cannot be compensated for by buses alone. Merchants are more in favor of providing more parking facilities than increasing transit service for their customers.

Finally, the problem most frequently expressed was bus speed and two-way operation. In general, there was common agreement that pedestrian traffic increased and that the general environment or the aesthetic quality of the street had been improved.

Most merchants responded that the transitway had had no significant impact on their deliveries. Smaller stores were seen to be at a disadvantage because they cannot control the time of delivery of goods and often have no rear access. The most frequent suggestion made for improving deliveries was to permit trucks onto the transitway during off-peak hours.

#### TRENTON COMMONS

Trenton, the capital city of New Jersey, is the center of the state, county, and city government. Trenton's population has recently declined, and its composition has changed drastically. However, its employment has grown slightly because of the expansion of state office functions.

The Trenton central business district (CBD), an area of only 2.5 km<sup>2</sup> (1 mile<sup>2</sup>), provides jobs for 30 000 private and government employees and offers a large percentage of the city's retail trade. Increased competition with new suburban shopping malls has resulted in a decline of downtown Trenton as the regional shopping center.

The Trenton Commons was planned as a comprehensive scheme aimed at revitalizing the downtown area. The two-block section of State Street between Warren and Montgomery streets, where most of the downtown commercial activity is concentrated, was closed to traffic and a pedestrian mall was created. It was expected that the mall would generate additional private investments, but these never materialized. The project was implemented in September 1974. Its cost of \$1.96 million was funded through a community development grant from the U.S. Department of Housing and Urban Development, city tax revenue, and state funds.

The city of Trenton Department of Planning and Development conducted a survey of downtown Trenton employees. The idea to poll consumer attitudes on several alternative solutions about downtown Trenton originated with the organization of downtown businessmen. During August 1976, 25 000 questionnaires were distributed to all government employees and to a few private downtown firms. More than 6000 questionnaires were returned by mail; 3000 of these were systematically selected and processed.

The survey results indicated that the majority of employees who responded avoid the downtown area (5). Forty percent bought lunch downtown and 33 percent shopped more frequently than once a week; only 13 percent did more than one-fourth of their shopping downtown and 67 percent did not do much shopping at all. Thirty-six percent never used downtown banking services. The area was rated poor compared with other shopping areas by 58 percent of the respondents.

Too many loiterers and rowdy youths were the two most serious problems. Safety was the third problem most frequently mentioned among those who shopped less frequently; those who shopped more frequently did not consider safety to be so important. Originally, the mall did contain outdoor seating areas and other amenities, but they were removed after 2 years because merchants complained that the setup encouraged loitering.

Parking problems were also seen as serious by more than half of the respondents. Lack of knowledge about the downtown area was striking. Of those who most often drove downtown, 67 percent did not know about the existence of free parking. A field survey indicated that, since Trenton Commons was implemented, commercial activity had not shown signs of the major improvements anticipated.

As a response to the survey, the downtown merchants decided to implement two subsidized experimental bus routes to shuttle workers from the outskirts of the downtown area to the commons during their lunch breaks. The experiment was successful in increasing patronage of the mall.

#### CONCLUSIONS AND SUGGESTIONS FOR FURTHER RESEARCH

The findings of this study indicate that there might be some validity to the hypothesis explored, and further investigation is warranted. Transportation facilities are perceived differently and have different effects on the attitudes and behavior of individuals depending on the surrounding environment and prevailing conditions in which they are experienced and the individuals' expectations. The case of Trenton Commons has shown that restricting automobiles cannot by itself reverse a situation or a trend of decay in downtown areas that are no longer viable centers. In Philadelphia, a relatively healthy and viable environment, the transitway survey has shown that people see automobile restriction as an effective tool in preserving and further improving the commercial vitality and the environmental quality of the

downtown area. In order for a transit improvement to have a significant impact, it must either present an intriguing new image or rally public support. The implications of these findings seem to deserve a wide audience among transportation planners who are working on automobile-restricted zones.

There is a general need for better understanding of user behavior and how it relates to public transportation improvements. Previous research has dealt primarily with aggregate changes in physical and economic indexes (6). Little attention has been given thus far to microanalytic social and behavioral analyses. There is no single design and operation that will fit in all environments and satisfy all users. Therefore, knowledge of the local needs and potential use of the facility can be useful in the planning, design, and management of the project.

Another conclusion of this study is that the concept of the transitway mall seems self-contradictory. It provides neither the relaxed atmosphere of a pedestrian mall nor the efficiency of a transit thoroughfare. If the objective is to discourage through traffic, other alternatives such as the "traffic cell" concept should be further explored (7).

Certain recommendations emerge from the analysis of the survey results (4). In the case of the Trenton Commons, the problem lies in the poor image of the downtown area. Solutions should aim to improve the unsafe image and to strengthen the retail and service base. In the case of the Chestnut Street Transitway, the problems lie in the fact that certain actions—physical and operational improvements aimed at utilizing the project—have not been taken yet. Suggestions for further study include improvements of bus operations through proper signalization and reassignment of bus routes, relaxation of restrictions to allow private automobiles after working hours, the establishment of flexible regulations on deliveries, and provision of convenient, short-term, special-purpose parking facilities. A second category of recommendations includes substituting small, noiseless, and more pleasant looking vehicles for the current buses, adding outdoor activities, and improving and integrating overall city transit services.

Many important issues were only touched on here. There is an apparent need for further research on business activity patterns, change in the behavior of pedestrians and transit riders, and attitudes and opinions of users of the facility who are not downtown workers. Without a control group and baseline data, it is difficult to draw objective conclusions. Finally, because the technique of attitude surveys is limited by its very nature, supplementary indirect evaluation techniques are necessary.

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# Density as a Determinant of Highway Impacts

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The effects of superhighways in established residential areas in 23 standard metropolitan statistical areas in nine states are reported. Comparisons are made between affected and unaffected census tracts for 34 population and housing variables by using information from the U.S. Census for 1960 and 1970 and from state highway departments. The analysis tool is multiple regression, which permits statistical control for tract location and "history." Regressions were run separately for high- and low-density tracts, and housing density was posited as a conditioning factor of highway impact. Results indicate (a) substantial differences between affected and unaffected tracts in high-density tracts but not in the low-density stratum and (b) that despite these differences the highway impact variable accounts for little of the variance in the dependent variable. The latter finding implies that highways are of minor importance in explaining changes in census characteristics compared with general demographic trends and deliberate policies in metropolitan areas.

In recent years, there has been increasing concern that the construction of public works such as airports, dams, office buildings, and highways may have profound effects on natural and social environments. Obviously, each project is designed to produce at least one environmental change, such as damming up water, rerouting a stream, providing a detention center, or facilitating transportation. In addition to such manifest aims, however, there may be secondary effects on the surrounding areas that are neither intended nor beneficial.

For example, a new airport, while improving regional and national transportation networks, may affect land and housing values close to the facility and may create bothersome noise for nearby residents. The potential for such troublesome side effects, especially from very large projects, lies behind the drive for studies to assess the environmental impacts of such construction.

A concrete manifestation of the current interest in impact assessments can be seen in the National Environmental Policy Act of 1969 (NEPA). Section 102 of NEPA requires the relevant federal agency to produce an environmental impact statement (EIS) that discusses the likely consequences of a major federally funded construction project (31). An EIS is seen as a tool to aid policy makers to make better informed decisions on a proposed action and to take steps to eliminate or mini-

mize any harmful impacts likely to result from implementation.

An EIS is, however, an estimation of the likely consequences of a project. These projective statements are rarely, if ever, subjected to postconstruction verification. Each project is treated on an ad hoc basis, and there is a minimum of information as to what might be anticipated on the basis of past experience. What is needed to make such assessments more convincing is some basic research on the empirical effects of large-scale construction.

This research provides a description of selected types of social impacts that have resulted from the construction and operation of multilane, limited-access highways in some urban areas. Thus, it is an effort to fill a gap in our empirical knowledge of such effects. Besides informing the impact assessment process, this paper also explores the factors that contribute to demographic change in urban areas. Despite a number of theories of urban morphology and several research techniques, only rarely have man-made elements of the social environment been treated as independent variables, as causal factors in and of themselves (23). This study views highways as an impacting agent whose effects are reflected in census data for cities.

## LITERATURE ON HIGHWAY IMPACT

Highways built through residential areas may have a variety of impacts. One may consider the financial and psychological costs to relocated individuals (4, 6, 11, 15), the pollution-related effects on those living in proximity to the road (5, 7, 12, 20), and of course the benefits to highway users. This research focuses on the "remaining neighborhood," defines and measures the amount and nature of change in the characteristics of population and housing, and isolates that portion of the change attributable to the road.

Most of the empirical work on remaining neighborhoods has dealt with the delineation of neighborhood boundaries and not with highway impacts themselves. There are many examples of these various approaches