

REFERENCES

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Abridgment

Factors That Influence Local Support for Public Transit Expenditures

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Survey data collected in Ann Arbor, Michigan, are used to assess the importance of various types of motivation to support a property-tax millage earmarked for public transit. A key finding is that user benefits are relatively less important than nonuser benefits in garnering local support. Concern over fuel depletion and overuse of automobiles, stimulation of business within the city, ability to use the service should one wish to, and a perception that the service offered is of high quality are major factors in transit support.

Faced with skyrocketing prices and uncertain supplies of fuel, urban travelers are increasingly turning to public transportation. Since transit users rarely pay their full costs, however, the operating deficits of many systems are increasing sharply with this added demand for service. Transit managers and local public officials are understandably hesitant to ask for higher taxes to finance transit during a period when real or spendable income is on the decline.

An incentive to generate local funds for transit service is provided by legislation passed at the federal level during the 1970s. Since 1974, each local dollar spent on operating a public transit system in larger cities is eligible to be matched by a federal dollar, up to the city's allocation limit (which is based on its population and density). In 1978, federal operating assistance was extended to small urban (population less than 50 000) and rural areas. Even with the substantial price reduction in transit brought about by the federal matching funds, many communities have garnered only a limited local share. As a consequence, they are receiving only a fraction of their full allocation of operating assistance funds.

The research reported here indicates that many public officials have been overly cautious in their hesitancy to place transit-financing referenda on the ballot. It may in fact be possible to obtain rather widespread support for a local tax if it is earmarked for provision of public transit. The results of the analysis to be summarized in this paper indicate that transit's constituency is potentially quite broad--supporters of transit are unusually diverse.

CASE-STUDY CITY

Ann Arbor, Michigan, has proved to be an excellent site to research the issue of local support for public transit expenditures. As is true of many states, Michigan law enables its cities to place referenda on the ballot that propose special property tax assessments to raise revenues for

specific urban services. In 1973, a proposal was placed on the ballot in Ann Arbor to increase the property tax by \$0.0025 which is equal to approximately \$50 for the average-valued single-family house within the city. The assessment was to be used to provide a transit service of considerably higher quality than existed at the time. It is worth noting that, because the referendum was placed on the ballot in 1973, the prospect of federal matching funds did not yet exist.

The millage proposal passed by a margin of almost 2:1 (61 percent). Late in 1976, the new transit system was fully operational in all sectors of the city; implementation was carried out incrementally over a three-year period. A propitious opportunity to study local support for transit financing developed at this time. City residents could see what their tax dollars were buying; it was decided to study how many residents would favor continuation of the millage and why.

DATA USED IN THE ANALYSIS

The city of Ann Arbor obtained a technical assistance grant from the Urban Mass Transportation Administration to evaluate public response to the improved transit system. A telephone survey of 1175 randomly selected Ann Arbor residents was administered in March and April of 1977 by the University of Michigan's Survey Research Center. The questionnaire was quite detailed; numerous attitudinal, behavioral, and situational measures were included.

To measure willingness to pay the property tax for transit, the following question was asked:

In April 1973, Ann Arbor voters approved a proposal to finance the public transportation system. This costs about \$25 per year for a family living in a house worth \$20 000, or about \$50 per year for a family living in a house worth \$40 000. Suppose the question of continuing this tax were on the ballot again; would you vote to continue the tax or would you vote against it?

It is noteworthy that respondents were informed how much the transit system costs them. (In the case of renters, a cost estimate was furnished based on an assumed monthly rental rate of 1 percent of the assessed value.)

In the analysis of responses to the support question, a number of measures were used as

predictor variables. The objective was to determine which personal attitudes, behavioral patterns, and situations in life make a person more willing to pay a local tax earmarked for public transit. A brief description of the measures used in the analysis follows.

Transit Use

The following measures of transit use were obtained:

1. Trips taken: The number of trips the respondent took by transit in the previous 30 days,
2. Transit to work: Whether or not transit is the mode usually taken in the journey to work (coded 1 if yes, 0 if no), and
3. Transit to shop: Whether or not transit is the mode most often used on shopping trips (also coded 1 if yes, 0 if no).

Benefits from Use by Others

Measures of benefits to others were as follows:

1. Service for the poor: The extent to which the individual feels that transit should be a service mainly for the poor (responses were scaled on a five-point Likert scale that indicated the level of agreement with a statement that said that transit should be a service mainly for the poor),
2. Business stimulation: The degree to which the respondent feels that transit stimulates local business (responses were similarly scaled in a five-point agree-disagree format),
3. Use by family: The extent to which the individual's support arises from use by his or her own family members (the same five-point scale was used), and
4. Low fares: The respondent's assessment of whether fares should be lowered, maintained at current levels (very low, \$0.25, with no charge for transfers), or raised. Respondents were informed that fares defrayed 16 percent of the system's operating costs (a three-point scale was used to measure responses).

Need for Transit

Transit need was measured by these criteria:

1. Automobile shortage: Whether there are more licensed drivers in the respondent's household than available automobiles (coded 1 if yes and 0 if no),
2. Nondrivers: The number of nondrivers (among persons nine years of age or older) in the household,
3. Working parents: Whether or not both parents (or the only parent) work and at least one child aged 9 through 17 years lives at home (coded 1 if yes and 0 if no), and
4. No other options: The degree of difficulty the individual feels he or she would experience in getting around without transit (scaled on a four-point scale).

Socioeconomic Status

Measures that indicated socioeconomic status were as follows:

1. Low income: Whether the individual's income is low, that is, under \$7500 (coded 1 if yes, 0 if no);
2. High income: Whether the individual's income is high, that is, \$25 000 or more (coded 1 if yes and 0 if no)--these two income variables allow an implicit comparison with the omitted category, middle income;

3. Owner occupancy: Whether the respondent's home is owner occupied (coded 1 if yes and 0 if no); and

4. Educational level: Level of education of the respondent in years of school completed.

Environmental Concern

Aspects of environmental concern measured were as follows:

1. Fuel conservation: The extent to which the respondent feels that transit should be used more as a fuel-saving measure (scaled in a five-point agree-disagree format), and
2. Reduced automobile role: Whether the individual feels that automobile use within the city should be discouraged through such policies as restricted zones and parking limitations (scaled in the same five-point format).

Ability to Use Transit

Transit use ability was measured by three criteria:

1. Personal fear: The degree to which an individual fears being mugged or assaulted while waiting for or riding in transit vehicles (on a five-point scale);
2. Work constraints: The presence of constraints, both temporal (e.g., work hours) and spatial (e.g., location of workplace), that preclude use of transit on work trips (coded 1 if constraints exist and 0 if they do not); and
3. Shopping problems: The perceived level of difficulty experienced in using transit on shopping trips, particularly when packages are carried (coded on a five-point scale).

Satisfaction with the Service

A single measure of the individual's perceptions regarding the quality of transit service being provided was used.

FOUNDATIONS FOR TRANSIT SUPPORT

The survey of Ann Arbor residents indicated that support for the transit millage tax had increased since its passage four years earlier. Of the 1175 respondents, 82.3 percent favored continuing the tax. A series of regression analyses were performed to assess the roles played by the preceding attitudes, behavioral patterns, and life situations in bringing about support for the transit millage tax. The fraction of variance (R^2) explained in these analyses was quite low--under 0.20. The reasons for this include (a) limited variance in the dependent measure (support) due to the high fraction of supporters and (b) the random noise one typically finds in survey data (as opposed to aggregate data). After the stronger predictor variables had been combined into a single equation, the following coefficients emerged:

| Variable | Coefficient | Significance Level |
|-------------------------|-------------|--------------------|
| Owner occupancy | -0.069 | 0.01 |
| Educational level | 0.008 | 0.05 |
| Fuel conservation | 0.037 | 0.01 |
| Reduced automobile role | 0.045 | 0.01 |
| Business stimulation | 0.028 | 0.01 |
| Low fares | 0.131 | 0.01 |
| Service for poor | -0.020 | 0.01 |
| Personal fears | -0.022 | 0.01 |

| <u>Variable</u> | <u>Coefficient</u> | <u>Significance Level</u> |
|------------------------|--------------------|---------------------------|
| Work constraints | -0.138 | 0.01 |
| Overall system quality | 0.027 | 0.01 |
| Constant term | 0.664 | |
| R ² | 0.14 | |

The two situational measures that best predict willingness to support local transit expenditures are owner occupancy and educational level. The negative relationship between home ownership and support for the transit tax clearly shows that renters are more likely to favor the millage. Since the property tax payments of homeowners are usually more visible than those of renters, this outcome is not surprising. Examining the data, we find that 14 percentage points separate renters from homeowners; approximately 87 percent of the renters in the sample (61.3 percent of all respondents) favored the transit tax. The strong positive relationship between education and support for the transit millage tax may be due in part to the presence of a major university in the case-study city of Ann Arbor. The data do indicate that (a) the highly educated overwhelmingly support transit and (b) they do so not so much out of personal use, but rather because they perceive other sorts of nonuser benefits.

One strong nonuser benefit that seems to motivate local taxpayers to support transit financing is fuel conservation. The highly significant relationship between the attitude that greater use of transit can reduce society's consumption of fossil fuel and the willingness to pay the transit tax indicates that concern over fuel supplies within this city may well be an important motivating factor in support of transit expenditures.

Similarly, those who favor a lesser role for automobiles as a means of personal transportation are strongly inclined to support local taxes dedicated for transit provision. Interestingly, many of those respondents who favor automobile disincentives were not frequently transit users at the time of the survey. Presumably this group feels willing to make greater personal use of transit if policies such as restricting automobile use downtown or reducing the availability of parking were implemented.

Lest one conclude that transit supporters in Ann Arbor are not sensitive to the economic well-being of the downtown area, it should be noted that business stimulation is a major factor in transit support. Belief that quality transit service can stimulate tax downtown business activity is a highly significant predictor of transit support. Many nonusers of transit apparently are willing to pay the transit millage tax because they feel that the gains to them of a healthier local economy are worth the cost of the tax. Examining the data closely, one finds that respondents who hold this view often are employed in downtown retail establishments.

Belief that fares should be kept low is another highly significant predictor of transit support. Users and nonusers alike are far more likely to support the millage tax if they feel that fares should not be raised to defray a larger portion of operating costs. Among other things, this finding indicates that policymakers may actually erode support for transit-financing measures by raising fares substantially. It should be noted, however, that relatively few respondents favor reducing fares further or eliminating them entirely.

The often-stated opinion that transit should be viewed as a service mainly for the poor does not emerge in Ann Arbor. To the contrary, there is actually a strong negative relationship between this

view and support for the transit millage tax. Examination of several related measures reveals that rather than being insensitive to the needs of the poor, most respondents see transit as a service that should be available to and meet the needs of everyone, which includes the poor. The view that only the poor should ride transit does not prevail in this community.

Although many respondents support transit without using it themselves, those who feel that they could not use it if they wished are much less likely to be willing to help finance it. Fear for one's safety while waiting for or riding in a transit vehicle has a strong negative relationship with the support measure. Similarly, the presence of constraints that preclude use of transit on work trips is highly inimical to support. Option value is clearly a very important factor in willingness to pay a tax for transit.

The importance of a good public image of transit in garnering local support for a financing measure is clearly indicated in this analysis. Regardless of respondents' use patterns, those who are satisfied with the overall quality of the service offered are far more likely to support the millage tax. This finding reinforces the truism that taxpayers, like private-sector consumers, are increasingly demanding their money's worth.

After consideration of the factors important to predicting an individual's willingness to pay a tax earmarked for transit, it may be instructive to briefly examine factors that have a surprisingly weak association with support. Members of the three classes of income do not vary remarkably in their support for the millage tax. Those in the sample who have low incomes support the millage tax in 90 percent of all cases, 75 percent of those with high incomes do so, and the middle-income respondents are about halfway between those percentages. Thus, while income has a negative relationship to transit support, the relationship is not particularly striking.

Perhaps of greater policy significance, users (those who had ridden transit at least once during the previous 30 days) are not significantly more likely to support the millage tax than are nonusers. Whereas 30.1 percent of those sampled had ridden within the previous 30 days, 82.3 favored continuation of the millage tax. Therefore, slightly more than half of those interviewed support the sizable transit assessment without using it themselves. Even those who need transit for mobility are not significantly more supportive than nonusers who see transit as bringing about other socially desirable effects.

POLICY CONCLUSIONS

One could argue that Ann Arbor is not a typical U.S. city and therefore that the conclusions reached in this analysis must be viewed as representing an exceptional case. In counterpoint, excluding students from the sample during analysis did not produce a noteworthy change in the extent or nature of transit support. Nonetheless, the influence of a major university on community attitudes and behavior is often subtle. A cautious interpretation is that, although most or all the factors present in Ann Arbor exist in other communities, they may well be less pronounced than they are in this city.

To the extent that the results of this research are transferable, the constituency for transit in U.S. cities is very diverse. Besides those who themselves ride the system, supporters also include those who wish to see a healthier local economy, environmentalists, and even those who view transit

as something of a back-up mode. With this broad spectrum of supporters, it is probable that city officials generally have been too cautious in proposing transit-financing plans. The results of this analysis indicate that a quality transit service, the benefits of which are effectively

communicated to the public, can command a high degree of support at the local level.

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Abridgment

Organization Theory and the Structure and Performance of Transit Agencies

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Relationships between structural and performance variables were studied in 16 public transit organizations in California. Data were collected from archives, personal interviews, management surveys, and on-site observations. Statistical analyses focus on associations between structural variables and organizational efficiency, effectiveness, and employee commitment. Organization size, span of control, centralization, and length of managerial tenure were all associated with higher levels of organizational performance. Specialization and formalization were found to be associated with lower levels of performance on certain efficiency and effectiveness indicators.

In order to obtain a fair share of the increasing quantity of financial support available from government agencies, the administrative intensity of transit organizations has been increased. This paper presents some of the results of research aimed at determining how these changes in organizational structure affect transit performance (1). Data for the study were collected from organizational archives, personal interviews, management surveys, and on-site observation of 16 fixed-route bus systems located throughout California. Statistical analyses focused on the relationships among structural variables (organizational size, span of control, number of specialties, administrative intensity, formalization, standardization, and centralization), attitudinal variables (job satisfaction and employee commitment), and organization performance (service efficiency and effectiveness and managerial tenure).

STRUCTURAL AND PERFORMANCE VARIABLES

Six characteristics of organizational structure were identified for analysis. Three measure the structural configuration of organizations: size, span of control, and length of managerial tenure. The remaining characteristics--centralization, formalization, and standardization--are measures of structuring behavior within the organization (2).

Formalization, standardization, and centralization allow organizations to carry on many activities efficiently. They knit together diverse activities of an organization through programs that link activities together. Structuring of activities gives a great deal of predictability and stability to whatever occurs in organizations. However, there are some costs in terms of inflexibility and red tape.

Standardized measures of performance in transit

are a fairly recent phenomenon. Measures have been agreed on, but collection of the data and their reliability vary. This study uses the performance indicators developed by Fielding, Glauthier, and Lave (3), in which each ratio is constructed so that higher values indicate better performance on that indicator. Reliability was enhanced by comparing results for 1976-1977 with data gathered from the same agencies in previous years.

Distinction is made between measures of efficiency and of effectiveness, since these are different concepts and should be measured separately. Efficiency is a measure of resources used to create transit service, whereas effectiveness measures the use of services produced. Three ratios were used to assess the efficiency of producing service, and five ratios were used to assess the cost and level of consumption.

The measures of organizational performance include statistics on employee turnover and the three efficiency and five effectiveness measures. Analyses consisted of correlating various structural and demographic variables with the performance measures. In some cases, a clear pattern seems to emerge for a particular structural dimension and performance. In most cases, however, structural dimensions show only moderate relationships with a few performance indicators. It is worth noting that in these latter cases, the relationships that demonstrated significance did so in a consistent manner (e.g., several effectiveness measures indicated a positive relationship with a particular organizational variable) and in accordance with the direction of the relationships that was suggested in the literature.

Organizational Size

A good deal of research has focused on the issue of how the size of an organization may influence various aspects of organizational success. An examination of the literature indicated mixed findings. Five of six studies that were performed in the last decade reported no association between size and performance. However, based on the results of several other studies, size appears to be positively associated with increased organizational efficiency (4). An analysis of the relationship between size and performance for our sample of 16