

DEVELOPMENT OF ALTERNATIVE MEASURES OF TRANSIT MODE SHARE

BACKGROUND

Transit mode share is used as a critical policy barometer at various geographic levels. Its magnitudes and temporal trends play an important role in both policy debates at areawide levels (nationwide, states, regions, etc.) and in performance monitoring at sub-area levels (activity centers and corridors). The census journey-to-work data have typically been used for areawide measurement of transit's *usual mode share*, i.e., the share of workers who usually use transit for commuting. There has been much controversy and confusion in the literature about using census journey-to-work data to measure transit mode share. Among the controversies is whether transit mode share should be measured only for locations where transit is available. The confusion relates to whether transit's usual mode share would understate transit's *actual mode share*, i.e., the share of work trips by transit as revealed by respondents to daily travel surveys.

OBJECTIVES

The research goal was to examine the controversy and confusion in the literature and to develop alternative measures of transit mode share. This study was designed to accomplish the following tasks: (1) develop a framework for considering the measurement of transit mode share; (2) analyze the confusion regarding the relationship between transit's usual and actual mode shares; (3) assess the sensitivity of transit mode share to a variety of controversies raised about using the census journey-to-work data for measuring transit mode share; (4) examine areawide measurement of transit mode share; and (5) examine sub-area measurement of transit mode share.

FINDINGS AND CONCLUSIONS

The objectives were successfully achieved. The following summarizes the main findings and conclusions for each of these objectives, which are presented in further detail in the final report.

(1) Framework: The framework defined key terminologies, identified a four-step approach for developing alternative measures for the transit mode (i.e., specify the purpose of measurement, specify a set of criteria for evaluation, evaluate alternative measures using these criteria, and select alternative measures based on this evaluation), discussed the purpose of measurement, and discussed a set of evaluation criteria (including clarity, validity, modal consistency, statistical quality, cost of measurement, responsiveness, and timeliness).

(2) Usual/Actual Mode Shares: Through both theoretical and empirical analyses using the 2001 National Household Travel Survey, it is clear that transit's usual mode share is greater than its actual mode share, and the difference is significant, ranging from 14.7 percent to 87.3 percent across 34 socio-demographic population segments in the nation. The reason is that more non-transit trips are made by workers who usually commute to work by transit than the number of transit trips made by workers who usually commute to work by non-transit. Despite this significant difference, transit's usual and actual mode shares are highly correlated. While it would not be an appropriate target for calibrating travel models, transit's usual mode share can still be used as a performance measure.

(3) Sensitivity: The concerns raised in the literature over transit mode share are not unique to using journey-to-work data for measuring transit mode share. They are not about the technical soundness of the practice, but about ignoring other alternative treatments for each of the four elements of measuring transit mode share. Any measurement of transit mode share can be subject to similar concerns. Rather than trying to avoid them, the focus should be on selecting alternative measures that are most appropriate for the particular situation at hand.

(4) Areawide Measurement: There are two real alternative measures for areawide measurement of transit mode share: one based on the number of person trips by all residents in areawide geography during a given period for all purposes and the other on the number of workers. While the first has several minor advantages, the second involves minimal cost to implement. The first option would require original data collection through statistical sampling every time measurement is required. With the relatively low magnitude of transit mode share experienced in Florida at areawide levels, the cost involved is too high for periodic measurement. The second option, however, can be implemented without any original data collection. It can be reliably measured annually for areawide geographies with a population of at least 65,000 using information contained in pre-tabulated tables from the Florida sample of the annual American Community Survey (ACS) starting 2006.

(5) Sub-area Measurement:

Field Observations. Field observations could be used to measure transit mode share for travel into activity centers and for travel passing cutlines across individual corridors. However, further research would be needed to assess the statistical variations of transit mode share for field observations of activity centers and corridors, and also to evaluate the improved accuracy in observed transit loading between in-vehicle load checks and roadside load checks.

Using Existing Processes. Studies already performed under FDOT's MPO Transit Quality of Service Evaluation Program that identify activity centers and the longitudinal dimension of corridors in terms of activity centers at their two ends could be expanded and modified to measure transit mode share.

Small-Area Census Data. Small-area census data in the Census Transportation Planning Package (CTPP) for sub-area measurement of transit mode share for travel into activity centers and for travel within corridors that consist of TAZs could be used for statewide sub-area measurement of transit mode share.

BENEFITS

More effective and efficient use of transit services can reduce congestion and enhance overall mobility. The contribution of this research is that it provides decision-makers with several options to assess the effectiveness of transit policies in Florida. The study addressed travel options and basic motorized mobility, statewide measurement of transit mode share based on commuting under all conditions (with or without travel service availability and during all time periods), and effectiveness of transit policies in Florida for congestion relief in individual sub-areas. Further research is needed to implement some of the findings detailed in the final report.

This project was conducted by Xuehao Chu, Ph.D., of the University of South Florida. For more information, contact Ike Ubaka, Project Manager, at (850) 414-4931, ike.ubaka@dot.state.fl.us.