



Neighborhood Crime and Travel Behavior: An Investigation of the Influence of Neighborhood Crime Rates on Mode Choice - Phase II

Christopher E. Ferrell, PhD, Shishir Mathur, PhD,
Justin Meek and Matthew Piven

MTI Project 2802
January 2012

SJSU Research Center
210 N. Fourth St., 4th Fl.
San José, CA 95112

Tel // 408.924.7560
Fax // 408.924.7565

www.transweb.sjsu.edu

Board of Trustees

Founder

Secretary Norman Y. Mineta

Honorary Co-Chairs

Congressman John L. Mica
Congressman Nick Rahall

Chair

Mortimer Downey

Vice Chair

Steve Heminger

Executive Director

Hon. Rod Diridon, Sr.

Thomas E. Barron
Ignacio Barrón de Angoití
Joseph Boardman
Donald H. Camph
Anne P. Canby
Julie Cunningham
William Dorey
Malcolm Dougherty
Nuria I. Fernandez
Rose Guilbault
Ed Hamberger
Hon. John Horsley
Will Kempton
Michael Melaniphy
William Millar
Hon. Norman Y. Mineta
Stephanie L. Pinson
Dean David Steele
Paul A. Toliver
Michael S. Townes
David L. Turney
Edward Wytkind

There are considerable environmental and public health benefits if people choose to walk, bicycle, or ride transit, instead of drive. As a result, planners and policy-makers are increasingly looking for ways to encourage alternatives to driving. Most mode choice research and practical interventions undertaken to-date have focused on improvements to non-auto infrastructure (e.g., transit services, bike lanes, sidewalks) or making the physical environment more transit-, pedestrian-, and bicycle-friendly (e.g., transit- and pedestrian-oriented design). However, little work has been done on the effects of neighborhood crimes on mode choice. Instinctively, we understand that the threats posed by possible criminal activity in our neighborhoods can play a major role in our mode choice decisions, but so far we have little empirical evidence to support this notion.

This study provides evidence that high levels of neighborhood violent crimes increase automobile use.

Study Methods

Starting in January 2006, the police departments of thirty-six cities in the San Francisco Bay Area were contacted requesting crime data for the year 2000—the year in which our travel survey data was collected by the Metropolitan Transportation Commission for the Bay Area. Of the thirty-six cities contacted, seven cities (Berkeley, Concord, Oakland, Santa Clara, Walnut Creek, San Francisco, and Sunnyvale) ultimately shared their data. While Phase 1 calculated and tested crime variables by counting the number of crimes within Transportation Analysis Zones (TAZs), Phase 2 of this research project developed a series of binary logit models using new, disaggregate crime variables measurement techniques (as a basis for comparison to Phase 1), a series of multinomial logit (MNL) models to identify the impact of crimes on four mode choices—auto, transit, walking and biking—and a set of MNL model runs focused on transit access trip mode choice to identify which portions of transit trips are most responsive to neighborhood crime levels.

Findings

This report—describing Phase 2 of a research study conducted for the Mineta Transportation Institute on crime and travel behavior—finds that high crime neighborhoods tend to discourage residents from walking or riding a bicycle. When comparing a high crime to a lower crime neighborhood the odds of walking over choosing auto decrease by 17.25 percent for work trips and 61 percent for non-work trips. For transit access to work trips, the odds of choosing walk/ bike to a transit station over auto decrease by 48.1 percent. Transit trips, on the other hand, appear to respond to neighborhood crime levels in a similar way to auto trips, wherein high crime neighborhoods appear to encourage transit mode choice. The odds of taking transit over choosing auto increase by 17.25 percent for work trips and 164 percent for non-work trips—a

counter-intuitive result. Surprised by this last finding, the research team tested two possible explanations for why high levels of neighborhood crime would increase transit use: 1) the MNL models do not adequately account for the effects and interplay between urban form and crime levels and mode choice; and 2) people who ride in cars or take transit may feel more protected when riding in a vehicle (termed here, the “neighborhood exposure hypothesis”). To investigate the first explanation, the researchers tested a number of alternative urban form and crime interaction variables to no effect. Digging deeper into the second hypothesis, the researchers tested whether the access portion of transit trips (walking, bicycling, or driving to a transit stop) is sensitive to neighborhood crimes as well, wherein high crime neighborhoods discourage walking and bicycling and encourage driving to transit stations. The report provides evidence that high crime neighborhoods encourage driving to transit stops and discourage walking or bicycling, supporting the neighborhood exposure hypothesis.



Policy Recommendations

This study provides evidence that high levels of neighborhood violent crimes increase automobile use. When aiming to reduce auto emissions, suburban sprawl, obesity rates, and other societal ills that come with auto dependency, planners and policy-makers need to look at a range of interventions. While the arguments in favor of reducing auto dependency through land use and urban design interventions have attracted serious attention in recent years, these changes take place over the course of decades, as will their anticipated benefits. Improved crime intervention strategies that can reduce the safety concerns of residents living in high-crime neighborhoods hold promise for more immediate benefits and should be considered as part of a larger package of both short-term and long-term measures to reduce auto dependency.

Second—and much to our surprise—high-crime neighborhoods also favor transit use. A simplistic assessment of these findings may lead to the conclusion that we may be able to increase transit use by adding additional transit services to high-crime neighborhoods. However, the Neighborhood Exposure Hypothesis and our findings that high-crime neighborhoods also encourage residents to drive instead of walk or ride a bike to transit, suggest that transit oriented development plans that do not address the safety concerns of residents will fall short in reducing auto trips.

About the Authors

Christopher E. Ferrell is a co-founder and principal at CFA Consultants, Shishir Mathur is Associate Professor of Urban and Regional Planning at the San José State University, Justin Meek teaches at San José State University (SJSU) in the Urban and Regional Planning Department and works as an independent consultant for municipalities throughout the San Francisco and Monterey Bay Areas, and Matthew Piven is an urban planner interested in economic development and a recent graduate of the San José State University Master’s program in Urban and Regional Planning.

To Learn More

For more details about the study, download the full report at transweb.sjsu.edu/project/2802.html

MTI is a University Transportation Center sponsored by the U.S. Department of Transportation’s Research and Innovative Technology Administration and by Caltrans. The Institute is located within San José State University’s Lucas Graduate School of Business. [WEBSITE www.transweb.sjsu.edu](http://www.transweb.sjsu.edu)