

“TELE-commuting” during the COVID-19 Pandemic and Beyond: Unveiling State-wide Patterns and Trends of Telecommuting in Relation to Transportation, Employment, Land Use, and Emissions in California

Tianjun Lu, Ph.D. Fynnwin Prager, Ph.D.
 Jian-yu Ke, Ph.D. Jose N. Martinez, Ph.D.

Project 2147
 August 2022



Introduction

Telecommuting, which enables employees to perform job tasks remotely at home, increased significantly (25% to 35%) early in the COVID-19 pandemic. This shift represented a major societal change that reshaped the family, work, and social lives of many Californians, also raising important questions about what factors influenced telecommuting before, during, and after COVID, and to what extent changes in telecommuting have influenced transportation patterns across other commute modes, employment, land use, and environment. Additionally, state agencies, metropolitan planning organizations, and local governments are faced with questions about internal organizational concerns and regional policy, of what factors might explain changes in workplace culture and commuting patterns, and how long they are likely to continue.

Study Methods

This study conducted state-level telecommuting surveys using a crowd-sourced platform (i.e., Amazon Mechanical Turk) to obtain valid samples across California (n=1,985) for employees in numerous sectors. The study also conducted state-level interviews among stakeholders (n=28) across ten major industries (e.g., Transportation and Warehousing, Professional and Business Services) in California in the perspectives of employers. Additionally, the study leveraged secondary datasets and developed regression and time-series models to explore the patterns and trends of telecommuting in California.

Findings

Trends show an inverse relationship between staying at home and transport usage, though the latter changed by much larger amounts, and suggest that a “new normal” of telecommuting has emerged. The state-wide surveys of employees support these

findings, suggesting that telecommuting has been widely adopted and is likely to continue for at least 3 years. The state-level interviews of managers and executives confirmed that workplace cultures across numerous key industries have shifted in ways that would likely see more working from home and fewer vehicles on the road. Regression results suggest that pre-COVID county-level factors, especially poverty levels, influenced staying at home and transportation behaviors. Panel data analysis suggests that changing policy stringency, economic support levels, and county-level factors—especially broadband and higher home prices—influence all travel behaviors. These influences shifted during the pandemic, with policy and risk perception factors appearing to play a more dominant role early in the pandemic, while the roll-out of vaccines appears to have reduced the importance of policy and risk perception factors on travel behaviors. Surveys and interviews also highlighted the benefits and costs of telecommuting for employees and organizations alike, which may contribute to reduction, consolidation, or rearrangement of the office spaces. These findings suggest that fewer cars on the road in general and during commute hours would lead to a reduction in emissions.

Policy Recommendations

The COVID-19 pandemic has motivated companies and organizations in California to rethink and revisit telecommuting policies. We appear to have reached a “new normal” in travel behaviors, including telecommuting and workplace trips, such that organizations will continue to adjust to lasting changes in workplace culture. Moreover, regional and local governments will need to adjust policies, programs, and possibly zoning rules to account for shifts away from in-person workplace attendance, which reduced demand for commercial workers and fewer workers supporting localized economies around offices. This study reveals advantages and disadvantages of telecommuting for organizations and employees alike, with surveys, interviews, and statistical analyses highlighting the complex relationships among COVID-19 outbreak, government policy, public risk perception, economic factors, and travel behaviors.

About the Author

Tianjun Lu, Ph.D.

Dr. Lu is the Principal Investigator of the study. Dr. Lu is an Assistant Professor in the Department of Earth Science and Geography at California State University, Dominguez Hills. His academic research and interests focus on transportation planning, air pollution exposure assessment, data analytics, and community engagement.

Jian-yu (Fisher) Ke, Ph.D.

Dr. Ke is an Associate Professor in the Department of Information Systems & Operations Management at California State University, Dominguez Hills. His academic research and interests focus on global supply chain management and manufacturing strategies.

Fynnwin Prager, Ph.D.

Dr. Prager is an Associate Professor of Public Administration at California State University, Dominguez Hills and Co-Director of the South Bay Economic Institute. His academic research and interests focus on transportation systems and the policy and economics of disasters.

Jose N. Martinez, Ph.D.

Dr. Martinez is an Associate Professor of Economics at California State University, Dominguez Hills and Co-Director of the South Bay Economic Institute. His academic research and interests focus on international migration, labor economics, econometrics, and time series forecasting.

To Learn More

For more details about the study, download the full report at transweb.sjsu.edu/research/2147



MTI is a University Transportation Center sponsored by the U.S. Department of Transportation's Office of the Assistant Secretary for Research and Technology and by Caltrans. The Institute is located within San José State University's Lucas Graduate School of Business.