

Moving from Walkability: Evaluating Traditional and Emerging Data Sources for Evaluating Changes in Campus-generated Greenhouse Gas Emissions

Project 1857
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Troy Kawahara, Bo Liu, Anurag Pande, PhD, Calvin Thigpen, PhD, and Carole Turley Voulgaris, PhD



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Universities are increasingly committing to reduce campus-generated greenhouse gas emissions, whether voluntarily or in response to a legal mandate. As an initial step to keeping these commitments, universities need an accounting of baseline greenhouse gas emissions levels and means of monitoring changes in campus-generated greenhouse gas emissions over time. Commute-generated greenhouse gas emissions from travel to and from campus by students and employees are among the most difficult to quantify. This report examines some of the challenges associated with estimating campus-generated greenhouse gas emissions and evaluates ways to address those challenges.

The purpose of this study is to identify changes in campus-generated travel behavior at California Polytechnic State University based on the results of three successive campus-wide travel surveys; to evaluate alternative data sources that have the potential to supplement or replace campus travel

surveys as a source of data for campus-generated greenhouse gas emissions; and to evaluate alternate methods to estimating greenhouse gas emissions from campus-generated vehicle miles traveled, depending on the presence of campus-specific information about vehicle fleet characteristics.

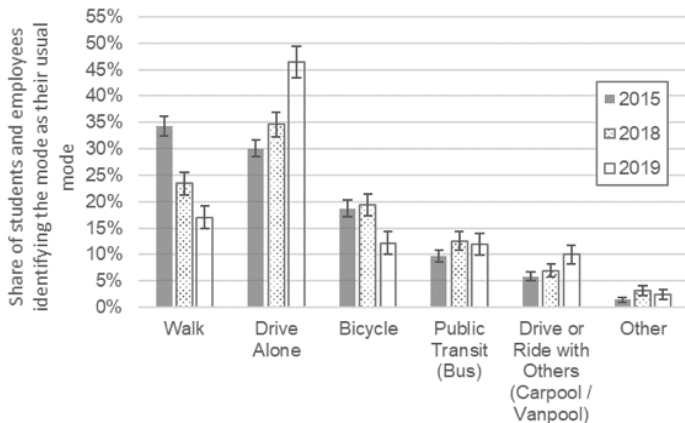
Study Methods

Three successive campus-wide travel surveys were distributed by email to members of the Cal Poly campus community in 2015, 2018, and 2019. Based on the results of the surveys, we analyzed changes in the mode shares for commutes to and from campus (i.e. the respective shares of commuters commuting by bike, transit, car, etc.) and changes in commute distance. For the 2018 survey, we supplemented the survey data with data from automatic traffic counters counting the number of vehicles entering and exiting campus, and origin-destination matrices generated from mobile device data.

Surveys that are limited to members of the campus community are likely to undercount campus-generated vehicle miles traveled by excluding infrequent, but potentially long, trips by campus visitors.

Findings

The results of successive travel surveys suggest that the campus population has become more car-dependent over time. Not only have students become more likely to drive to campus as they get older, each entering class of students appears to be more car-dependent than previous entering classes. Comparison of survey results with data collected from automating traffic counting devices and mobile device data suggest that surveys that are limited to members of the campus community are likely to undercount campus-generated vehicle miles traveled by excluding infrequent, but potentially long, trips by campus visitors. Finally, we find that using campus-specific information on the model years of vehicles used to commute to campus yields higher estimates of campus-generated greenhouse gas emissions, relative to average regional emissions rates.



Policy Recommendations

While campus-based travel surveys are a valuable source of information on travel behavior by member of the campus community, they are insufficient for estimating campus-generated vehicle miles traveled. Other data sources, including mobile device data and traffic volumes collected by automatic traffic counters, should be used to supplement travel survey data for this purpose. Moreover, for the

most accurate accounting of commute-generated greenhouse gas emissions, institution-specific information on the vehicle fleet used by institutional commuters is needed. This may be gathered from campus travel surveys or from an internal parking permitting office.

About the Authors

Troy Kawahara is a master’s candidate in Civil Engineering at California Polytechnic State University. Bo Liu is currently pursuing a PhD in urban planning at UCLA. Anurag Pande is an Associate Professor of Civil Engineering at California Polytechnic State University. Calvin Thigpen is a policy research manager. Prior to that, and during the completion of this study, he was a post-doctoral researcher at Arizona State University. Carole Turley Voulgaris is an Assistant Professor in the Department of Urban Planning and Design at the Harvard Graduate School of Design. Prior to that, and during the completion of this study, she was an Assistant Professor of Civil Engineering at California Polytechnic State University.

To Learn More

For more details about the study, download the full report at transweb.sjsu.edu/research/1857.



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