UCLA INSTITUTE OF TRANSPORTATION STUDIES

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IMPROVING THE NEXT GENERATION OF TRAVEL DEMAND MODELS TO BETTER REPRESENT PEDESTRIAN NEEDS

The Case in Large California Metropolitan Planning Organizations
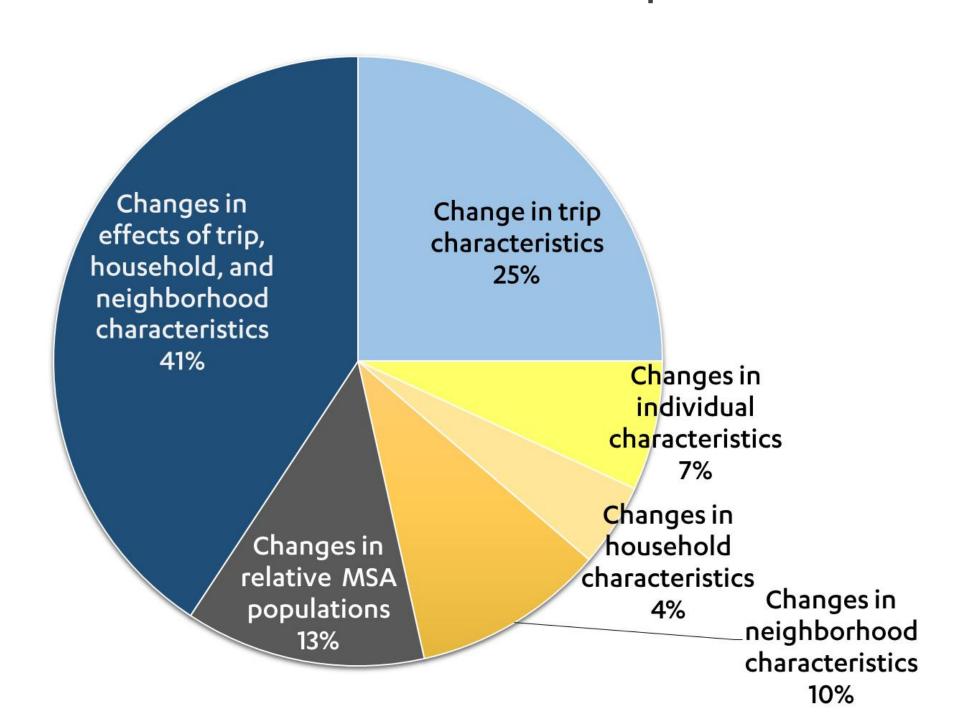
RESEARCH QUESTIONS

To what extent do current regional travel demand modeling approaches forecast and understand walking behavior?

What, if any, improvements should be made to these modeling approaches to better integrate and understand walking in the future?

MOTIVATIONS

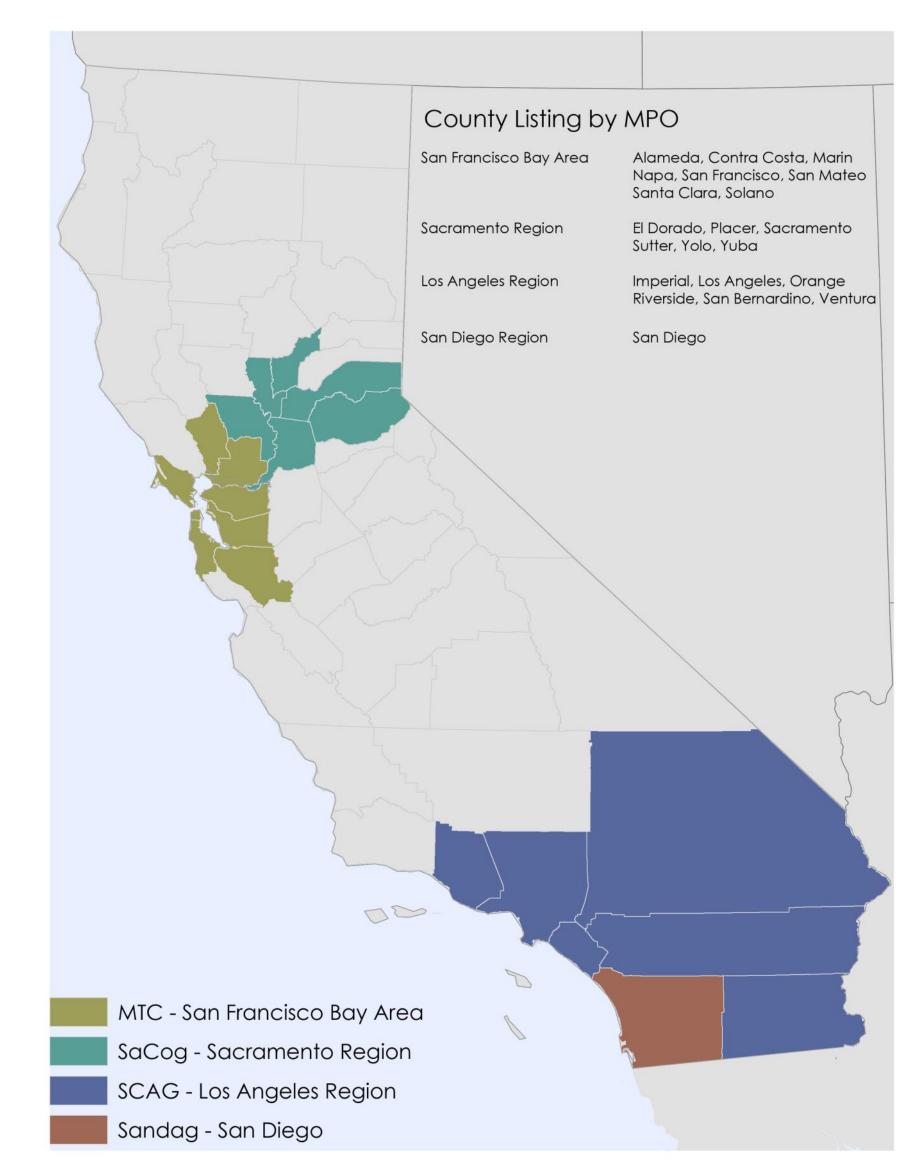**Walking is an important — and often overlooked — mode of travel.**

- Represents 9% of trips in CA in 2012- up from 5% in 2001 (CHTS); National increase in walking as well (NHTS). Growth in CA is related to a number of different factors, as plotted below.

Pie chart:
- Changes in effects of trip, household, and neighborhood characteristics 41%
- Change in trip characteristics 25%
- Changes in individual characteristics 7%
- Changes in household characteristics 4%
- Changes in neighborhood characteristics 10%
- Changes in relative MSA populations 13%

- Walking trips provide a host of positive outcomes — lower obesity rates, improved quality of life, better access to opportunities and no greenhouse gas emissions.

Travel demand models often inadequately incorporate walking and many models in the U.S do not forecast non-motorized travel at all. (Singleton and Clifton, 2013)

APPROACH

County Listing by MPO

San Francisco Bay Area	Alameda, Contra Costa, Marin Napa, San Francisco, San Mateo Santa Clara, Solano
Sacramento Region	El Dorado, Placer, Sacramento Sutter, Yolo, Yuba
Los Angeles Region	Imperial, Los Angeles, Orange Riverside, San Bernardino, Ventura
San Diego Region	San Diego

Legend:
- MTC - San Francisco Bay Area
- SaCog - Sacramento Region
- SCAG - Los Angeles Region
- Sandag - San Diego

Interviewed two staff members at each MPO with different perspectives on regional travel demand modeling – one directly involved with the modeling and a second who used the model output in planning applications.

INTERVIEW QUESTIONS

- Explain your modeling approach including which modes are included and where you get data about trips.
- Are the inputs or outputs validated?
- What is the purpose of conducting these regional travel demand models?
- What are the implications of these modeling efforts, and how are they used by your agency?
- What changes, if any, have been made to your modeling approach in the last ten years or so?
- How often do you inventory regional land use/built environment changes that may have an effect on travel? How are these land use changes incorporated into the travel demand modelling process?
- What types of trips is the model best and worst able to predict and how may this introduce bias into the approach?

FINDINGS AND RECOMMENDATIONS

FINDINGS	Input data from household travel surveys likely underreports walking trips.	Walking suffers from the weakest relationship between capacity and demand.	No MPOs have region-wide sidewalk inventories available, making it difficult to assess network gaps or any true pedestrian variables.	Geographic coarseness of large-scale models is a mismatch for short walking trips.
DATA	*"We are kind of comparing our data to make sure our assumptions are reasonable especially when we have sketchy data sources, which the household travel survey usually are."*	*"The RTP process requires you to have some kind of modeling framework in order to evaluate the outcomes of your investments"* *"Are we capturing the value of investments in amenities on the pedestrian side? Probably not."*	*"We don't know how many of those streets have sidewalks. We don't have [data on] how many of those streets have a landscape strip that buffers a pedestrian from noise on the street or perceived safety on the street, or whatever. So we have a street pattern variable which influences walking but we don't have anything that's a true pedestrian environment variable."*	*"Our current model has 1450 TAZs. The next version will have 60,000 so that is a 60x increase. And once you do that, there's a lot of things that just change in how you represent behaviors because you have a lot more detail."*
RECOMMENDATIONS	Continue to support statewide data collection efforts, increase sample size to get include more trips and consider Moving towards GPS collection efforts.	Collect information about pedestrian volumes at specific locations across the network to attempt to close this gap.	Work to develop and maintain a dataset on the presence and quality of pedestrian infrastructure.	Increase the number of traffic analysis zones, particularly in areas where you expect a high walking modal split. (e.g university campuses)

ACKNOWLEDGEMENTS

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