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Advancing Understanding of Long-Distance and Intercity Travel with Diverse Data Sources

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# Advancing Understanding of Long-Distance and Intercity Travel with Diverse Data Sources

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## Issue

The relative share of passenger miles of travel undertaken during non-routine out-of-town longer-distance trips is large (potentially 30% or higher) and growing. Research on long-distance travel, whether by surface or air modes, has been limited in the United States by lack of data, in part because household travel survey data focuses on daily routine travel. Planners will need to take long-distance travel and its associated impacts into consideration if they hope to address policy questions related to transportation system sustainability. These impacts include environmental degradation from greenhouse gasses and other emissions, and raise challenging questions about who “owns” or is associated with these emissions. Equity impacts include the relationship between travel and quality of life. Intercity travel provides access to employment, education, and experiential opportunities. It also provides access to increasingly large and geographically dispersed social networks and the important face-to-face interactions with family, friends, and colleagues.

This project had two main research questions. First, what is the best way to measure individuals’ long-distance travel in order to inform planning and policy? Second, what factors are associated with long-distance travel and do they suggest inequitable access to intercity and more distant destinations? This project relied on several innovative existing datasets, original interviews, and a unique survey of travel and social network geography.

## Key Research Findings

**No existing travel survey method provides adequate measures of long-distance travel.** Capturing long-distance travel requires either very large one-day travel diary samples, which create financial barriers for planning agencies, or very long recall time periods (months), which create substantial participant burden, often reducing the ability to recruit and retain research subjects. Long retrospective surveys that record travel once for the prior few months or year are prone to inaccuracies due to recall error. Surveys asking for typical travel, such as annual travel frequency, are also inaccurate. Passive mobile devices may be ideally suited to recording long-distance travel over long periods and expansive geography, but the personal variables useful for forecasting travel demand and understanding the relative differences in mobility are often missing.

Further compounding data collection challenges, the definition of long-distance travel requires updating to improve measurement. Researchers and planners have typically settled on 50- or 100-mile thresholds, lumping together cross-metropolitan trips by car or transit with transcontinental journeys – and everything in between. The definition of a long-distance trip also varies between policy questions and dictates survey method.

**Quantitative and qualitative data collected in Vermont indicates there is an unmet need for travel to long-distance destinations.** In-depth interviews with women in Vermont and a

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representative survey of the statewide population indicated a need or desire for trips out-of-town that people cannot or do not make. Overall, 22% of the statewide sample reported some level of unmet travel need on an annual basis. A sizable minority of interviewees indicated a desire to travel out-of-town more. Since travel surveys only measure realized travel, and neglect people's preferred travel or unmet needs, efforts to incorporate measures of unmet need in future surveys are essential.

**Long-distance travel levels are associated with income and potentially both race and gender. Equity in access to destinations beyond one's home city should be an important future research and planning question.** The California Household Travel Survey (2012-2013), the largest recent sample of long-distance travel, allows consideration of equity in access to destinations at distance. The data clearly show higher income households participate in more long-distance travel. Travel patterns differentiated by gender and race further underscore the importance of future efforts to understand how access to travel beyond one's home community is inequitably allocated.

**Methodological improvements are needed to advance understanding of the important relationship between long-distance leisure travel and the geography of one's social network.** Travel surveys and social network surveys are burdensome endeavors. Yet this research, and prior work by others, suggest that people travel extensively to participate in events with members of their social network, spend time with family and friends, and visit places of importance to their heritage. Understanding long-distance travel will require understanding the extent and geography of people's social networks. As the levels of personal leisure travel increase, a method to overcome this challenging data gap is needed.

**Both convenience survey samples and passive mobile device data are important for measuring long-distance travel.** Long-distance surveys are burdensome for participants. This research indicates that convenience samples with participants that have a keen interest in surveys or in travel offer a robust way to gather information on trip destination (length) patterns. Mobile devices are ideally suited for not only destination patterns but also identification of trip rates because they include larger samples and non-travelers. Passive mobile device data often lack the socioeconomic and trip purpose data useful for modeling and forecasting. While convenience survey samples offer a means to fill this gap they are often biased towards higher income and education groups, thus excluding non-travelers.

**Air travel is an important part of people's travel portfolio. Planners and researchers need to integrate it into data collection and modeling frameworks.** Air travel is no longer a rare event. All data sources in this research project measured significant air travel. In fact, the best models estimated from most datasets in this project were for air trip rates. A substantial portion of trips now offer travelers a choice between air and surface modes. In 17% of cases of most recent trips in a Vermont random sample, travelers pick their mode after selecting the destination. As planning models advance to include better representation of long-distance trips, these models must provide for meaningful inclusion of the air travel network.

## Further Reading

This policy brief is drawn from "Advancing Understanding of Long-Distance and Intercity Travel with Diverse Data Sources," a NCST research report by Jonathan Dowds and co-authors. To download the report, visit: <https://ncst.ucdavis.edu/project/long-distance-intercity-travel-diverse-data/>

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