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No Ticket to Ride: A Systematic Definition of Transit Insecurity

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Dan Nathan-Roberts, PhD
Noah Friedman-Biglin, PhD
Andy Chen
Ilayda Karagoel

A central development of the contemporary era is the mass availability of transit. However, the ability to move, its corresponding benefits, are not equally available to all. In our study, "No Ticket to Ride: A Systematic Definition of Transit Insecurity," we develop a research-based definition of 'transit insecurity': the inability of persons or communities to reliably access transit. The goal of this work is to unify existing research under a consistent conceptual heading and provide a framework that will foster future research in the area.

Study Methods

This study's methodology was comprised of two components. The first component consisted of a systematic analysis of existing literature on access to transit, and its effects on people and communities, published within the last 40 years. From this literature, we extracted three common themes around transit insecurity: income level, travel distance and duration, and transit accessibility. In the second part of our work, we used our literature analysis to craft a definition of transit insecurity based on the identified common themes.

Four factors affect transit insecurity: low income, long travel distance, long wait times, and limited accessibility

Findings

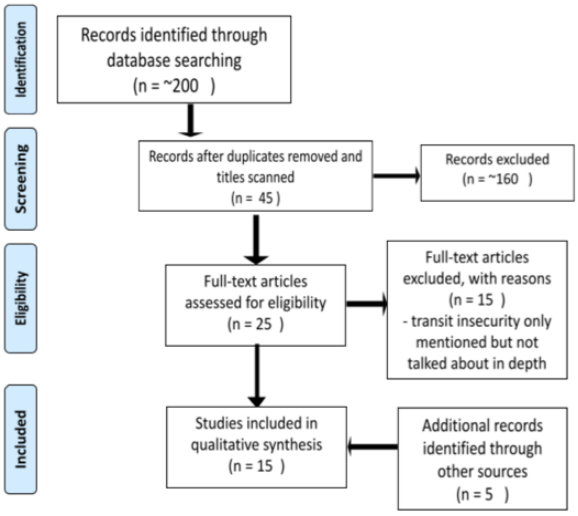
We identified four main themes in the transit literature. The first is income level. People living in low-income communities, and people whose personal income was low, were much more likely to be transit insecure. Studies conducted in China and Canada found that commuters from low-income suburbs were frequently unable to afford private transportation, and thus were forced to pay for expensive 'express' routes to work. This added expense led to either increased financial strain, or to the inability to afford this kind of transportation on a reliable basis. In addition to cost, both these studies highlighted the other common factors for transit insecurity: travel time and distance.

The second and third factors were persons who need to regularly travel long distances and persons who have long travel times, respectively. Some of the negative consequences from long travel distances and times overlap and are obvious, however other consequences are less immediately apparent. For example, a study, conducted in Nairobi, Kenya, found that those who had to use informal public transit called 'Matatus' were less likely to make use of maternal health services (like prenatal care) or modern birth control listing distance as a major deterrent, even when compared with those who had reliable access to personal transportation and similar journey times.

The fourth common factor for transit insecurity is the overall accessibility of the transit system. Accessibility can take many forms, from ramps and elevators to assist people with mobility impairments, to the choice of font size and pictogram use on signage to assist persons with visual impairments, and those who cannot read the posted language. Inaccessible design makes using public transit difficult for persons in these groups. Many with physical or mental impairments cannot get a driver's license, forcing them to grapple with inaccessible public systems as their only means of personal transport.

Policy/Practice Recommendations

An area of transit research that appears understudied is the impacts of unreliable access to transportation networks for commercial goods. In particular, we would like to see research done into the potential impacts on communities whose access to rail networks has been impacted by the transition from rail to trucking for transporting goods. Further, we suspect that there are links between transit insecurity and other, more well-studied issues like food- and job-insecurity; we hope these links will become increasingly apparent with further research.



Systematic Review Process Flow Chart

While there is much to be learned about transit insecurity from additional research, we also want to express a note of caution. Some literature discusses transit security as a problem solvable through the use of technologies, for example smartphone apps, augmented reality, or even novel last-mile technologies like e-scooters. These suggestions are presented as a way to alleviate the inaccessibility of public transit systems. However, each technological intervention comes with risks. We especially note risks associated with the use of personal data, for example real-time location tracking; even in cases where the user consents to their data being collected as part of the use of such technologies, there remain both legal and financial risks which primarily accrue to users.

About the Authors

Dr. Dan Nathan-Roberts is an associate professor of Industrial and Systems Engineering at San Jose State University. For this study, he collaborated with Dr Noah Friedman-Biglin, assistant professor of philosophy at San Jose State University, Andy Chen, and Ilyada Karogel.

To Learn More

For more details about the study, download the full report at transweb.sjsu.edu/research/1953

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