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Could Transportation Network Companies help Improve Rail Commuting?

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Issue

Commuter rail is known to have a "first- and last-mile" problem (i.e., a lack of options for getting commuters to and from a rail station). The first- and last-mile dilemma creates inequalities in access.[1,2] For example, high-income commuters drive to work (forgoing transit altogether), middle-income commuters drive to a rail station and pay to park, and low-income commuters rely on feeder buses or walking to reach a rail station.[3,4] Transportation network companies (TNCs), like Uber and Lyft, are a viable option for connecting travelers to rail stations, especially for those who don't own a car, however, their high fares make them attractive only to higher-income travelers.[5] To close this equity gap, subsidies could be provided for TNC rides that connect travelers to commuter rail. To explore this concept further, we developed idealized (but physically realistic and rational) models to describe communities in the San Francisco Bay Area, and simulated the effects of various subsidization policies (i.e., providing subsidies for TNC rides to and from rail stations, increasing rail stations parking fees) using real-world data representative of Bay Area commuter populations.

Key Research Findings

Commuters who drive to a rail station can be persuaded to leave their cars at home if high TNC subsidies are paired with modest increases to rail station parking fees. For example, in low-density settings, more than half the commuters who drive to a rail station will shift to taking a TNC (see Figure 1) if parking fees are modestly increased (about 30% to 40%) and if the TNC ride is highly subsidized (90% to 100% of the base fare). Having commuters leave their cars at home could free up parking spaces for more productive uses, such as transit-oriented development, and spur further rail ridership increases.[6]

Commuters who drive to work will not shift to rail transit, even if TNC service is fully subsidized. Higher-income commuters who live close to a freeway entrance view congestion, tolls, and parking fees as a fair trade-off. Subsidy policies should instead focus on improving access to existing users of rail transit and to those who otherwise confront problems accessing rail stations.

For communities with high-quality connections to rail stations (e.g., high-frequency bus service, good walking infrastructure), TNC subsidies should be targeted to specific populations. For example, in communities with good bus service to rail stations, providing TNC subsidies to all travelers could result in lower bus ridership. Additionally, in communities where many commuters walk to rail stations, providing TNC subsidies to all travelers could induce more vehicle travel (i.e., more TNC travel). TNC subsidies in communities that have good options and alternatives for traveling to and from rail stations should focus on specific commuter groups (e.g., low-income commuters, those in neighborhoods without bus access, groups who cannot walk to rail stations). Subsidizing TNC trips to rail stations can

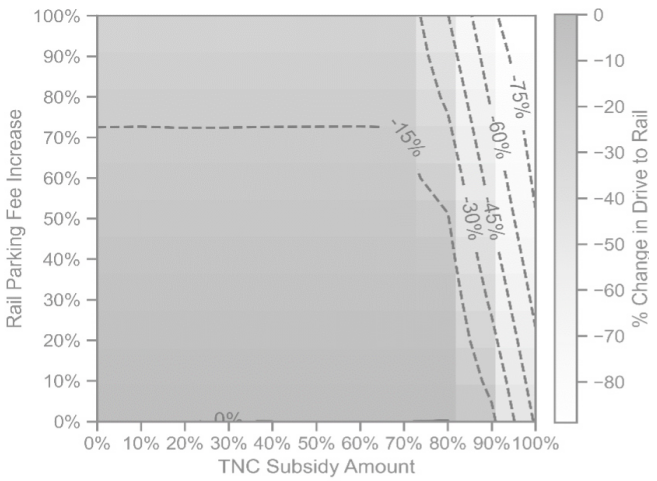

Figure 1. Impact of TNC subsidy levels and rail station parking fee increases on a commuter's willingness to drive to a rail station in Richmond, CA

decrease low-income commuter's daily commuting costs (including travel time) by as much as 10%. TNC subsidies can be distributed through social service agencies and nonprofit community organizations to help meet the goals of their transportation assistance programs.

TNC subsidies needs to be tailored to local conditions. The following demographic and geographic characteristics for each community need to be considered when exploring if and how much to subsidize TNC rides to transit stations or other related policies (i.e., increasing rail station parking fees): i) commuter income level, ii) population density, iii) availability and quality of alternative options for travelers to access rail stations, iv) the community's distance from the primary workplace (e.g., downtown San Francisco), and v) vehicle ownership rate. Negative effects must also be taken into account when using disincentives as policy levers, such as increasing rail station parking fees. For example, increasing parking fees at stations closer to the central business district could cause commuters who normally drive to the station to instead drive directly to work.

More Information

This policy brief is drawn from the report "Subsidizing Transportation Network Companies to Support Commutes by Rail" prepared by Wesley Darling and Michael J. Cassidy with the University of California, Berkeley. The report can be found at www.ucits.org/research-project/2022-24. For more information about findings presented in this brief, please contact Wesley Darling at wesley_darling@berkeley.edu.

[1]Zellner, M., D. Massey, Y. Shiftan, J. Levine, and M. J. Arquero. Overcoming the Last-Mile Problem with Transportation and Land-Use Improvements: An Agent-Based Approach. No. 4, 2016, pp. 1–26.

[2]Kåresdotter, E., J. Page, U. Mörtberg, H. Näsström, and Z. Kalantari. First Mile/Last Mile Problems in Smart and Sustainable Cities: A Case Study in Stockholm County. Journal of Urban Technology, Vol. 29, No. 2, 2022, pp. 115–137. https://doi.org/10.1080/10630732.2022.2033949.

[3]O'Fallon, C., C. Sullivan, and D. A. Hensher. Constraints Affecting Mode Choices by Morning Car Commuters. Transport Policy, Vol. 11, No. 1, 2004, pp. 17–29. https://doi.org/10.1016/S0967-070X(03)00015-5.

[4]Ha, J., S. Lee, and J. Ko. Unraveling the Impact of Travel Time, Cost, and Transit Burdens on Commute Mode Choice for Different Income and Age Groups. Transportation Research Part A: Policy and Practice, Vol. 141, 2020, pp. 147–166. https://doi.org/10.1016/j.tra.2020.07.020.

[5]Shaheen, S., W. Darling, J. Broader, and A. Cohen. Understanding Curb Management and Targeted Incentive Policies to Increase Transportation Network Company Pooling and Public Transit Linkages. University of South Florida, Tampa, FL, 2021.

[6]Cervero, R. Transit-Oriented Development's Ridership Bonus: A Product of Self-Selection and Public Policies. Environment and Planning A: Economy and Space, Vol. 39, No. 9, 2007, pp. 2068–2085. https://doi.org/10.1068/a38377.

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