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Exploring Unintended Environmental and Social Equity Consequences of Transit-Oriented Development

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POLICY BRIEF

Issue

Coordinated land use and transportation plans that locate high-density, mixed-use development near high-quality rail and bus transit are essential in helping communities reach important goals, such as economic development, reduced traffic congestion, greater transportation choices, and improved public health. These plans may also be critical to meet greenhouse gas (GHG) reduction goals and reduce harmful effects to human and natural systems.¹ However, there are concerns that these plans could undermine the well-being of low-income groups and GHG reduction efforts.

Investments for transit-oriented developments (TODs) may increase property values and gentrification, which could cause displacement of low-income groups. If low-income groups are pushed out of TODs, they will likely live farther from their daily destinations, require a car for transportation, and be more likely to buy a used or older-model car that will increase GHG emissions. Furthermore, higher-income families living in TODs may be more likely to drive since they can afford it, further increasing GHG emissions. By using the Sacramento PECAS (Production, Exchange, and Consumption Allocation System) and Sacramento travel demand models, the effects of TOD development policies on the larger economy and on specific socio-economic groups can be predicted.

Key Research Findings

The models simulated a 30% increase in light rail stations, 33% increase in bus lines, 5% increase in freeway lane miles, and 84% increase in high-occupancy vehicle (HOV) lane miles from 2014 to 2030. They tested the effects of these increases on population, housing, rent, consumer surplus by location, and change in travel behavior. Overall, they showed effects on households of all income classes (low, medium, and high) in TODs comparable to those in the surrounding, non-TOD region.

TODs enhance population and employment growth. Average zonal population and employment density is larger in the TOD areas relative to the region and the difference grows from 2014 to 2030 (by 54% and 61%, respectively).

Housing displacement does not occur, although rents may rise and should be monitored. Compared to the region, the share of households in the TOD areas is higher for low- and medium-income groups and lower for the high-income group. Over time, the changes are generally consistent across income groups. These results do not suggest displacement of low-income groups in the TOD areas.

From 2014 to 2030, medium-income households' mean rents move closer to their regional mean while low-income and high-income households' mean rents move above their regional mean. These differences are relatively small and within the margin of model error. However, they could suggest some upward pressure on rents over time for low-income households, which could possibly lead to displacement in the future. In general, all regions should

monitor changes in TOD rents over time and take steps to ensure affordable low-income housing.

Households benefit from TODs. Households across all income classes benefit from TODs, through improved access to services, less demand for driving, and better distribution of jobs, compared to non-TOD communities.

Total travel is up, per capita travel is down. The modeling shows a 21% increase in total vehicle miles travelled (VMT) from 2014 to 2030. However, on a per capita basis, VMT declines by about 5%. Without California's Advanced Clean Cars standard and Low Carbon Fuel Standard, the modeling shows total on-road GHGs would increase by about 23%, but per capita GHGs would decrease by 0.3%. With these standards, total on-road GHGs would decline by about 5% and per capita GHGs by 0.4%.

Overall, all income groups in TODs experience either positive or equal benefits compared to non-TOD households in the region. There is no evidence of low-income displacement from TOD policies and per capita VMT and GHG emissions decline.

More Information

This policy brief is drawn from the "Exploring Unintended Environmental and Social-Equity Consequences of Transit Oriented Development" research report from the National Center for Sustainable Transportation (NCST) authored by Caroline Rodier, Farzad Alemi, and Robert A. Johnston of the University of California, Davis. The full report can be found on the NCST website at <https://ncst.ucdavis.edu/project/ucd-ct-to-006/>.

For more information about the findings presented in this brief, please contact Caroline Rodier at cjrodier@ucdavis.edu.

¹ Kay, A. I., Noland, R. B., & Rodier, C. J. "Achieving reductions in greenhouse gases in the U.S. road transportation sector." *Energy Policy*, 69 (2014), 536-545

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