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Road Expansion is a Fundamental Cause of Growth in Vehicle Travel

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Issue

California is unlikely to meet its climate goals if it doesn't reduce vehicle travel. So far, however, state and local efforts to reduce vehicle miles traveled (VMT) have fallen short of expectations, even as cities grow more compact and public transit funding has increased. To better understand the role of highway expansion in meeting California's climate goals, we analyzed whether a simple model that only considers road capacity and population growth can predict VMT as well as traditional transportation models. We also looked at the share of recent VMT growth that has been caused by expanded road capacity, and the reductions in VMT from transit and other projects funded by California's climate investments.

Key Research Findings

Road expansion accounts for the largest share of growth in freeway traffic in recent years. Between 2000 and 2019, new and widened freeways induced 14 billion miles of new vehicle travel in California, accounting for 41 percent of new freeway traffic. Population growth accounted for a further 6 billion miles (18%). Across the U.S., new and widened freeways accounted for more than half (55%) of the observed increase in freeway driving over this period.

At the national scale, just two variables—road capacity expansion and population growth—predict vehicle travel better than traditional models based on incomes and fuel prices. At the metropolitan regional scale, road capacity expansion predicts vehicle travel almost as well as complex regional travel demand models, although our regional-scale sample was small and the evidence less conclusive. Overall, the results suggest that road capacity is the fundamental force that shapes transportation systems, land use patterns, and household travel decisions. Road capacity not only determines travel times and automobile accessibility, but also shapes pedestrian connectivity, land development, transit service feasibility, and household decisions on employment and residential location.

The state's current climate investments will only partially offset vehicle travel generated by recent highway expansions. The Greenhouse Gas Reduction Fund (GGRF) is supported by revenues from the state's cap-and-trade auctions, and through March 2024, 39 percent of the awarded funding—$3.1 billion—went to projects that reduced at least some driving. Overall, GGRF-funded projects reduced driving by an estimated 2 billion miles in 2023, and are projected to reduce 2.9 billion miles a year by 2040 once projects that have been funded but are not yet operational take effect. However, these reductions are much smaller than the additional driving—14 billion miles in 2019—induced by recent highway expansions (Figure 1). While the GGRF is only a small part of the overall transportation funding pie, our analysis helps to illustrate how the effects of this program, and others like it, are limited if highway expansion continues.

Public transit improvements are likely to have little impact on driving in places where freeway congestion is severe. Drivers switching to public transit will simply increase the available road capacity and reduce travel times on parallel roadways, freeing up capacity for other users to make new or longer trips by car. Such "backfilling" is most likely to be acute where expanded transit runs parallel to heavily congested freeways. But carefully designed transit, pedestrian or bicycle

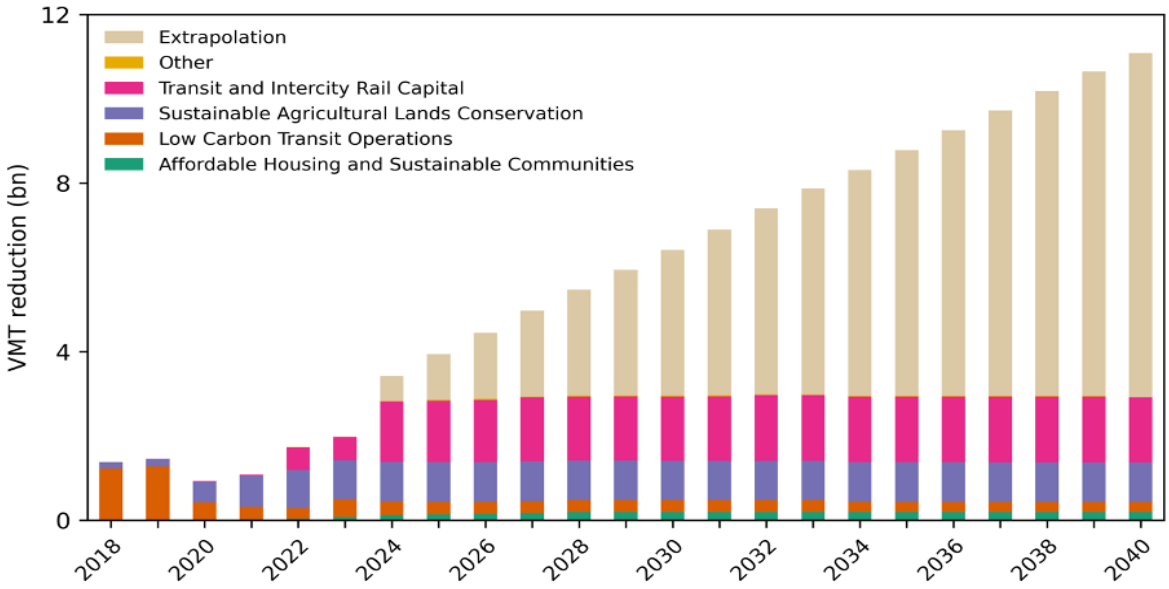

Figure 1. Annual VMT reductions from GGRF-funded projects.

improvements that physically reduce road capacity for cars—for example, transit priority or bicycle lanes or wider sidewalks that replace general-purpose vehicle lanes—may actually decrease driving. Encouraging infill development or implementing transit improvements that do not parallel highways could also help slow the growth of traffic with little or no backfilling.

Policy Implications

Policymakers looking to substantially reduce vehicle travel will need to eliminate some existing road capacity, as well as limiting expansions. On arterial roads, capacity reduction might entail "road diets" and similar street redesigns that dedicate space for buses, bicycles, and pedestrians. On freeways, road capacity reductions could involve dedicating lanes to transit, or even removing entire facilities. For example, part of San Francisco's Central Freeway was demolished in 2003, and Caltrans is currently studying removing I-980 in downtown Oakland. Importantly, freeway removal projects also serve broader community goals such as freeing up land for housing, speeding up trips for transit riders, and improving safety for pedestrians and cyclists by replacing freeways with multimodal boulevards. Any road capacity reduction comes as a side effect.

More Information

This policy brief is drawn from the report "Road Capacity as a Fundamental Determinant of Vehicle Travel" by Adam Millard-Ball and Michael Rosen at the UCLA Luskin School of Public Affairs. This policy brief and the associated report can be found at www.ucits.org. For more information about the findings presented in this brief and the report, please contact Adam Millard-Ball at adammb@ucla.edu.

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