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Notes

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Project Title:
UTC - Exploring Unintended Environmental
and Social-Equity Consequences of Transit
Oriented Development

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

Exploring unintended environmental and social-equity consequences of transit oriented development (TOD) using a spatial economic land use and activity-based microsimulation travel model

WHAT IS THE NEED?

Communities throughout the U.S. are pursuing land use and transport plans that locate high density, mixed use developments near high quality rail and bus transit service. These TOD plans are intended to meet important community goals, such as economic development, reduced congestion, greater transport choice, and improved public health. In addition, TOD plans are critical to managing the growth in vehicle travel necessary to meet greenhouse gas (GHG) reduction goals. Increasingly, however, there is concern that these plans may have unanticipated consequences that are inequitable and could undermine GHG reductions.

The proposed research will use the official Sacramento Production, Exchange and Consumption Allocation System (PECAS) land use model and activity based microsimulation travel demand model. This model will be used to simulate the effect of TOD plans on rents, location of low income households, and travel (mode, trips, auto ownership, and distance) over time throughout the region and, more granularly, those directly attributable to TODs in the region. The study will provide important policy insights, evidence, and practical guidance on a pressing subject that has received little attention.

WHAT ARE WE DOING?

The proposed research will use the official Sacramento PECAS land use model and activity based microsimulation travel demand model to simulate the effect of plans on rents, location of low income households, and travel (mode, trips, auto ownership, and distance) over time throughout the region and, more granularly, those directly attributable to TODs in the region. Different scenarios will be simulated and the effectiveness of measures to redress negative outcomes will be tested. The Motor Vehicle Emission Simulator (MOVES) model and an economic lifecycle assessment model will be used to examine GHG emissions. The following tasks will be performed:



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- 1) **Literature Review:** Review and summarize the literature including the effects of TODs on gentrification, displacement, travel, GHGs, and policy instruments to mitigate negative effects.
- 2) **Simulate Scenarios with Sacramento PECAS and Agent-Based Modeling (ABM):** Develop data files necessary to simulate the regions' current business as usual Sustainable Communities Strategy (SCS), and a more aggressive SCS. Evaluate land use and travel model results. Compare and contrast the mechanisms underlying changes in different types of TODs. Attempt to create a typology of TODs defined by key characteristics. Simulate additional scenarios to test the effectiveness of different transportation and policy instruments' (identified in Task 1 above) ability to mitigate displacement and increased vehicle travel impacts. Evaluate these results.
- 3) **Simulate GHG Emissions with MOVES and Economic Input-Output Life Cycle Assessment (EIO-LCA):** Apply these models to scenario results and evaluate them.
- 4) **Draft Final Report and Conduct Outreach Activities.** Communicate policy level implications of the study as well as practical methodological guidance for Metropolitan Planning Organizations (MPO) to implement similar studies (see policy impact plan below).

WHAT IS OUR GOAL?

The results of this study will not only provide important policy insights to decision makers who are currently grappling with these issues, but it will also provide practical guidance to MPOs on the use of newly available land use and travel models to understand equity and GHG effects of transport and land use policies.

WHAT IS THE BENEFIT?

The proposed study will provide understanding, evidence, and methods on how to mitigate potential inequitable and GHG inducing effects of land use and transport plans that are critically needed to meet GHG reduction goals from the transport sector.

WHAT IS THE PROGRESS TO DATE?

Task 1: Literature Review, months one through six. Conducted initial review of the literature.

Task 2: Simulate Scenarios with Sacramento PECAS and ABM, months three through eight. The Sacramento PECAS and SACMET model are now running in our lab. We are testing simple scenario simulations. We plan to consult with Sacramento Area Council of Governments (SACOG) on developing the final scenarios once we see the results of our simple tests. This ensures that the project benefits both Caltrans and SACOG. We have developed a set of more complex scenarios based on our analysis of the literature. We are beginning to code and run these scenarios.

Project Status: The additional calibration delayed the progress of scenario simulation. We anticipate completing the scenario simulation at the end of month 10 instead of month eight. We still anticipate completing the entire project on time.