



Caltrans Division of Research,  
Innovation and System Information

# Research



# Notes



Executive

## Advanced Road Charge (RC) Models

Understanding Equity and Transportation Impacts of Four RC Demonstrations in California.

MAY 2020

Project Title:  
Alternative Transportation Finance

Task Number: 3500

Start Date: July 1, 2020

Completion Date: August 31, 2022

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### WHAT IS THE NEED?

Mileage-based revenue collection, or Road Charge (RC) models, are evolving and can more closely match user-pays funding principles than a gas tax (based upon miles driven); however, the externalities of those miles driven do not equal across road users. Additionally, even revenue neutral RC programs, if implemented, would leave a funding gap given that current state and federal gas tax receipts predominantly result in budgetary shortfalls for transportation infrastructure. Recent interest has been shown at the local, regional, state, and federal levels in researching evolving transportation funding sources following the user-pays principle.

### WHAT ARE WE DOING?

This research specifically targets towards certain emerging trends in transportation (i.e., Transportation Network Companies (TNCs), automated vehicles). Building upon current and recently completed research, user elasticity related to pooled shared ride services, including TNCs and the equity of mileage-based fee programs, the researchers propose the use of a combined methodology:

1. Statewide stated preference surveys, and
2. Data gap analysis of publicly and/or privately available data (e.g., driver behavior under RC conditions, vehicle occupancy data, travel diaries, etc.).



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## WHAT IS OUR GOAL?

Such analyses would provide insights for decisionmakers into the design of a potential future RC program, with elements to include:

- Potential design mechanisms for equitable vehicle-specific RC rate setting based upon selected externalities (e.g., roadway damage, emissions, etc.)
- Vehicle/driver characteristics include, but are not limited to: weight class; level of automation; use case (commercial, for-hire, personal); propulsion system; value; occupancy; deadhead miles
- Instruments to assess user response and potential vehicle miles traveled rebound effects in both the short- and medium-terms
- Elasticities of demand to be evaluated using discrete choice analysis and multivariate analysis of travel behavior (e.g., modal split, trip purposes, etc.) and vehicle ownership (e.g., vehicle shedding, purchasing, and suppression)
  - Equity analysis using the STEPS (Spatial - Temporal - Economic - Physiological - Social) Transportation Equity framework to enumerate and evaluate possible considerations
  - Additional considerations for an increasingly automated and connected fleet
  - Examine Senate Bill 1014 data opportunities (i.e., data warehousing and pipeline structuring in an RC environment, employing TNCs as Commercial Account Managers or TNC data)

## WHAT IS THE BENEFIT?

The analysis and conclusion would identify how the insights can aid in the development of pricing mechanisms that move closer to the user-pays principle. While this data and analysis are necessary to help develop a robust pricing scheme, the vehicle-specific RC presented in this report will seek to embody the user-pays principle

to a greater extent than flat-rate gas taxes and miles-based user fees (MBUFs) by aligning the distribution of the cost burden across road users according to their relative road use and greenhouse gas emissions.

Practitioners, researchers, advocates, and policymakers can use this document to better understand the tradeoffs present in transportation funding and management decisions, especially when planning over long time horizons in the midst of uncertainty. Parallel research directions include examining public knowledge and perception of many of these strategies.

It remains likely that most of the alternatives outlined above will be subject to public acceptance and approval understanding the ways public perception, either of the whole population or of segments of interests, develops with exposure to these novel concepts will be key to successful implementation. This type of work could also reveal secondary effects resulting from MBUFs that planners and researchers might have missed in their initial scoping and formulating exercises or previous modeling work.

## WHAT IS THE PROGRESS TO DATE?

The project contract was signed by Department of General Services (DGS) on March 13, 2020. The contract will start June 1, 2020. A project kick-off meeting is to be scheduled in late May.

More Information:

<http://www.its.berkeley.edu/node/13432>