

Charging Drivers by the Gallon vs. the Mile: An Equity Analysis by Geography and Income in California

Findings for the CTC RUC TAC

Presented by Asha Weinstein Agrawal, PhD

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Acknowledgements

Authors: Samuel Speroni, Asha Weinstein Agrawal, PhD,
Brian Taylor, PhD, and Michael Manville, PhD

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Outline

Methods

Findings: Vehicle Fuel Efficiency

Mileage

Fuel Consumption

Cost of the State Fuel Tax vs. a Hypothetical RUC

Implications for Policymakers

To Learn More

Overview of Methods

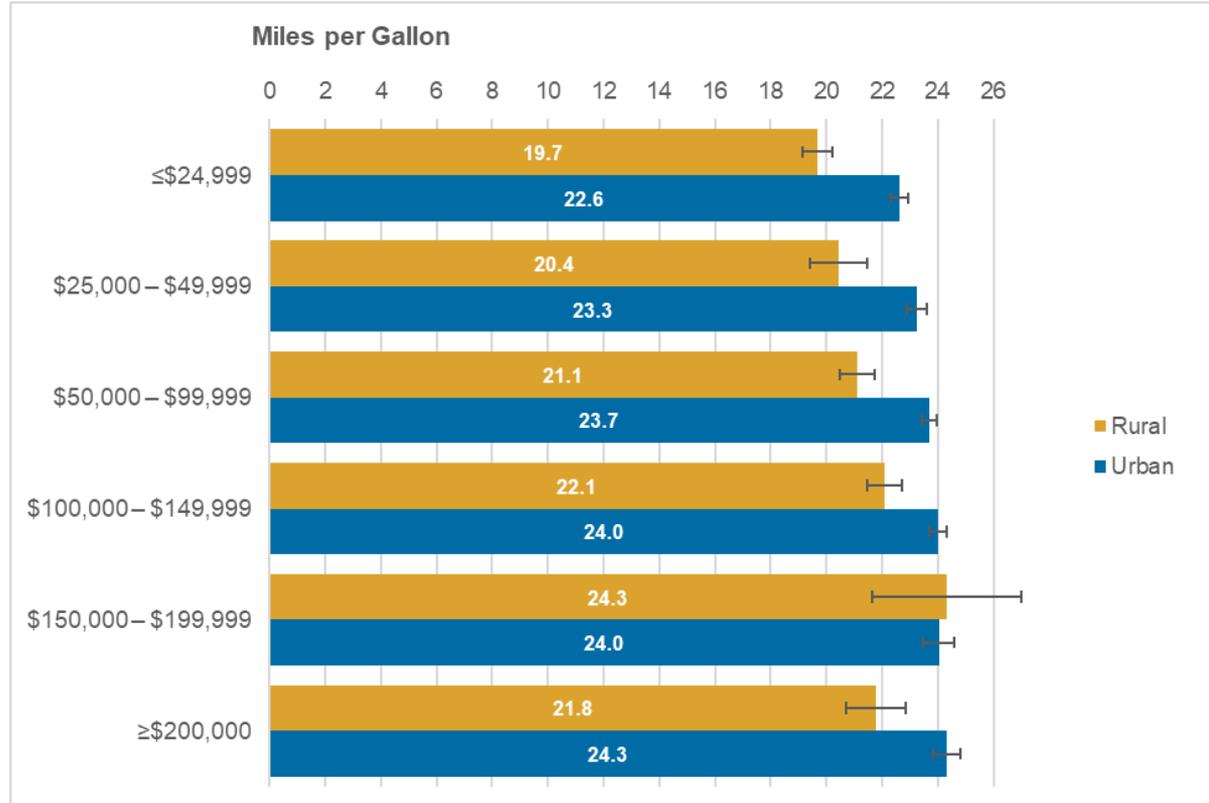
- Used data from the 2017 NHTS California Add-On Sample
- Analyzed households owning at least one gas/diesel vehicle
- Calculated “household fuel efficiency” as the average fuel efficiency of all gasoline and diesel vehicles in the household
- Classified households as urban or rural (inside vs. outside a Metropolitan Statistical Area)
- Estimated the rate for a hypothetical revenue-neutral RUC at 2.52 cents/mile (fuel tax collected + an estimated 6% in administrative costs)

Household Average Fuel Efficiency*

The highest-income households own vehicles that are 8% more efficient than those owned by the lowest-income households: 24.22 vs. 22.49 MPG, a difference of 1.73 MPG

Urban vehicles are 12% more efficient than rural vehicles: 23.57 vs. 21.08 MPG, a difference of 2.49 MPG

* Average efficiency of all ICE vehicles in a household

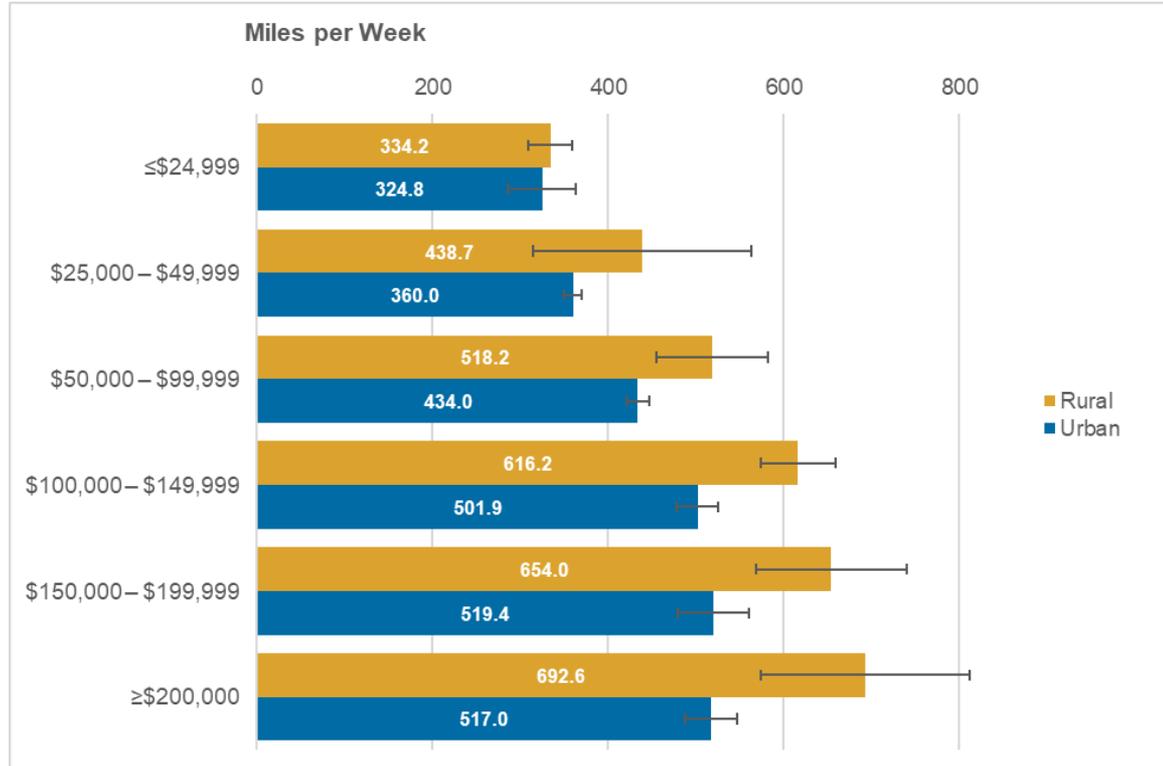


Note: Error bars represent the 95% confidence interval.

Household VMT per Week

Rural households drive 18% more miles weekly than urban households: 503 vs. 427, a difference of 75 miles per week.

The highest-income households as a group drive 61% more miles per week than the lowest-income households: 524 vs. 325 miles, a difference of 198 miles per week.



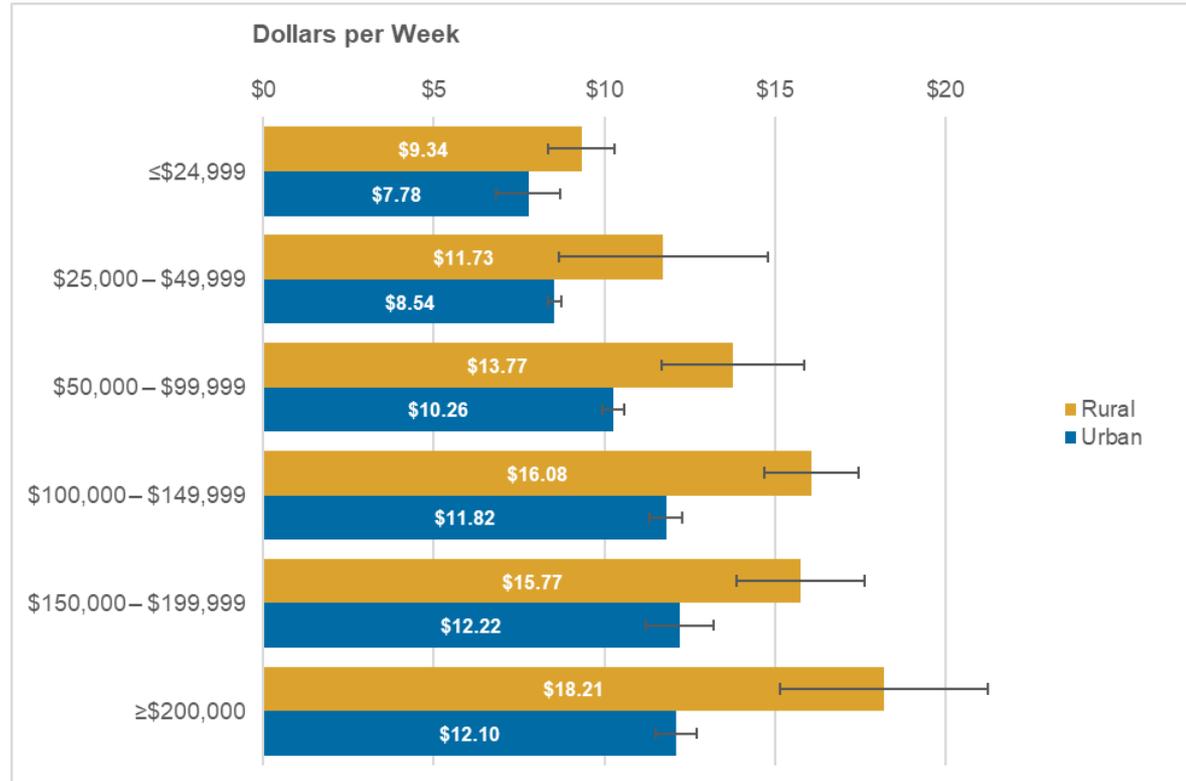
Note: Error bars represent the 95% confidence interval.

Household Weekly Fuel Tax Cost

The highest-income households pay 57% more than do the lowest-income households: \$12.33 vs. \$7.86, a weekly difference of \$4.47

Rural households pay 32% more than urban households: \$13.31 vs. \$10.10, a weekly difference of \$3.21

The difference between rural and urban households grows along with income, from about 20% more (\$1.56) for the lowest-income households to about 50% more (\$6.11) for the highest-income households

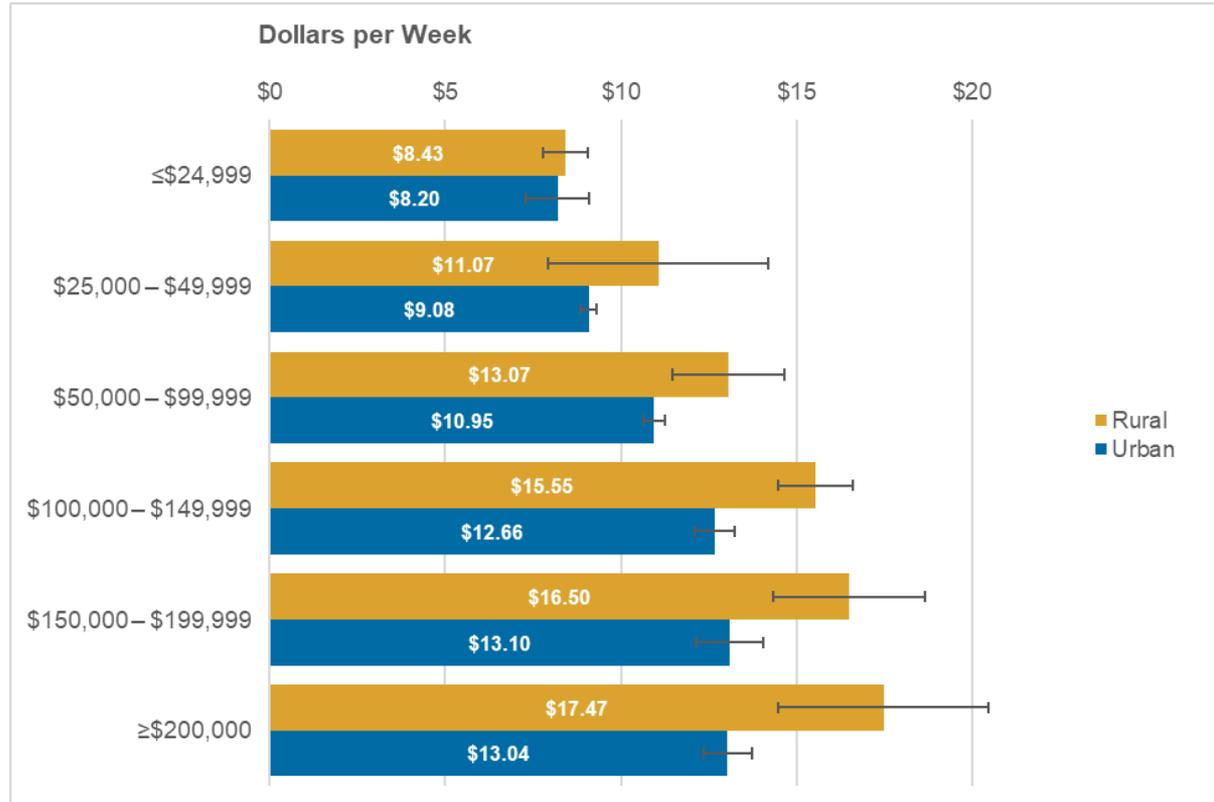


Note: Error bars represent the 95% confidence interval.

Household RUC Cost Per Week

Rural households pay 18% more (\$1.91) per week than urban households: \$12.69 vs. \$10.78, a weekly difference of \$1.91

The highest income households pay 31% more than the lowest-income households: \$13.12 vs. \$8.21, a weekly difference of \$5.00

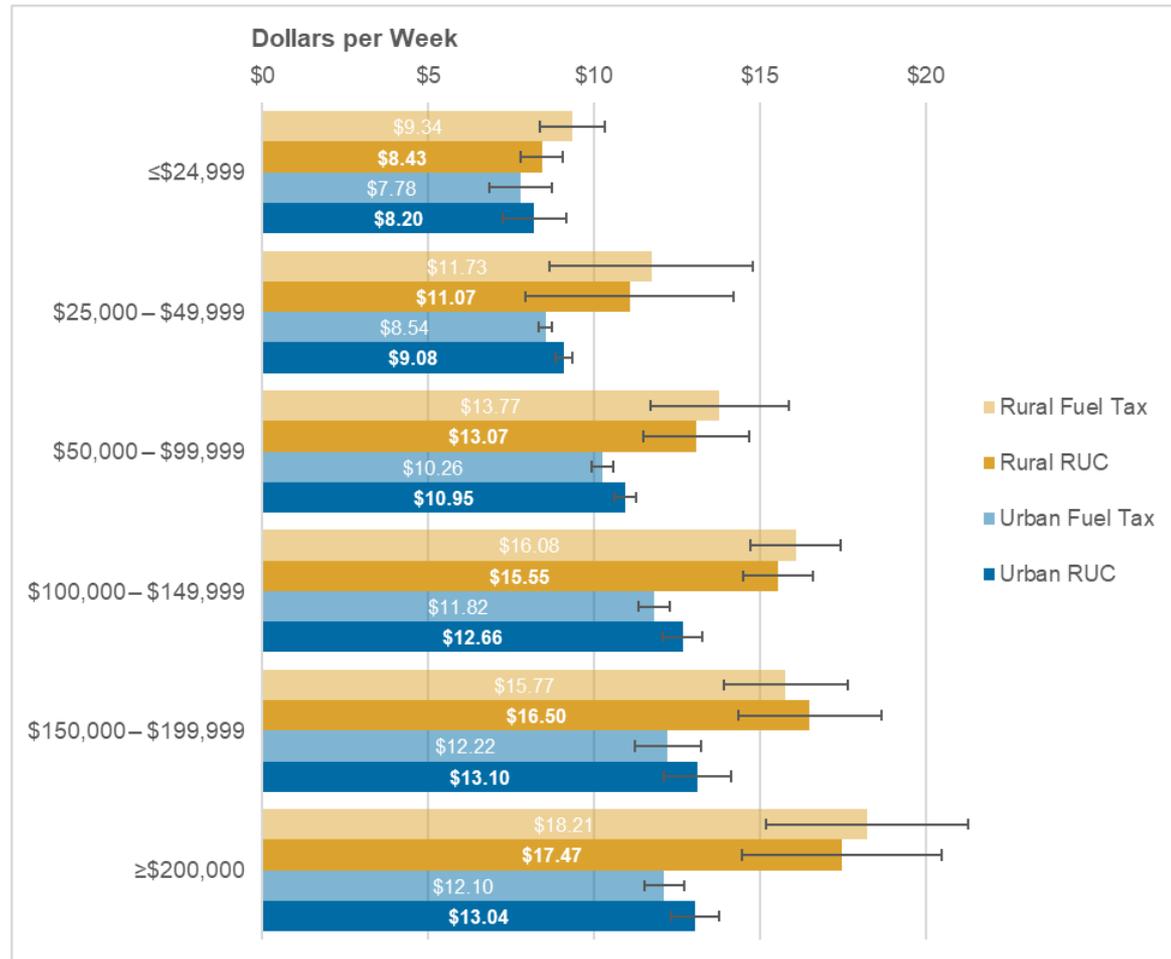


Note: Error bars represent the 95% confidence interval.

Weekly Household Cost: Fuel Tax & RUC

The switch lowers costs for rural households and increases them for urban households

The cost per week changes less than \$1.00 for every household group (see next slide)



Note: Error bars represent the 95% confidence interval.

Change in Weekly Household Cost if Replacing the State Fuel Tax with a RUC, by Income & Geography

Income group	Rural	Urban	Statewide
≤\$24,999	-\$0.91	+\$0.42	+\$0.35
\$25,000 – \$49,999	-\$0.66	+\$0.54	+\$0.48
\$50,000 – \$99,999	-\$0.70	+\$0.69	+\$0.62
\$100,000 – \$149,999	-\$0.53	+\$0.84	+\$0.79
\$150,000 – \$199,999	+\$0.73	+\$0.88	+\$0.88
≥\$200,000	-\$0.74	+\$0.94	+\$0.88
Statewide	-\$0.62	+\$0.68	+\$0.62

Note: Red shading represents a cost increase and grey shading represents a cost decrease.

Weekly Household Fuel Tax vs. RUC Cost, by Household Vehicle Fuel Efficiency

Costs drop for the households with lower average fuel efficiency (up to 21.0 MPG) and rise for the more efficient vehicles (21.1 MPG or higher)

Households with the most efficient vehicles will pay \$2.36 more per week, and households with the least efficiency vehicles will pay \$2.35 less per week.

Vehicle fuel efficiency quintile	Fuel Tax	RUC	Change (Fuel tax - RUC)
< 19 MPG	\$11.61	\$9.26	-\$2.35
19 - 21 MPG	\$11.87	\$10.96	-\$0.91
21.1 - 23.4 MPG	\$10.45	\$10.60	+\$0.15
23.5 - 27 MPG	\$9.77	\$10.95	+\$1.18
> 27 MPG	\$7.39	\$9.75	+\$2.36

Note: Red shading represents a cost increase and grey shading represents a cost decrease.

Summary of variations by income and geography

	Variation by geography	Variation by income
Fuel efficiency	Urban households own vehicles that are 12% more fuel-efficient vehicles than do rural households: 23.6 vs. 21.1 MPG	The highest-income households own vehicles that are 8% more efficient than those owned by the lowest-income households (24.2 vs. 22.4 MPG)
Mileage	Rural households drive 18% more miles weekly than urban households (503 vs. 427 miles).	The highest-income households drive 61% more miles per week than the lowest-income households (524 vs. 325 miles)
Fuel tax	Rural households pay \$13.31 weekly vs. \$10.10 for urban households, a difference of \$3.21 per week.	The highest-income households pay \$12.33 per week vs. \$7.86 per week for the lowest-income households, a weekly difference of \$4.47.
Shift to a RUC	Lowers costs for most rural households and raises them for all urban households.	Raises costs more for the wealthiest households than for lower-income ones

Potential policy concerns and solutions

Concern

Options

The shift in cost from inefficient to efficient vehicles runs counter to state climate policy of reducing fossil fuel consumption

Charge a RUC rate that varies by fuel efficiency and/or combine the RUC with a fuel tax

Slightly increases costs for the poorest urban households

Charge lower rates for low-income households and/or use block-rate pricing

Requires collecting an additional 6% in revenue, statewide

Justify the extra cost by designing a RUC that improves upon the equity of fuel taxes, such as with cost reductions for the poorest households

To learn more:

- MTI report:
[Charging Drivers by the Gallon vs. the Mile: An Equity Analysis by Geography and Income in California](#)
- Email Asha Weinstein Agrawal, PhD
asha.weinstein.agrawal@sjsu.edu

