

Evaluating Alternative Transportation Revenue Regimes Using the NHTS Transferability Statistics and Other Nationally Available Data

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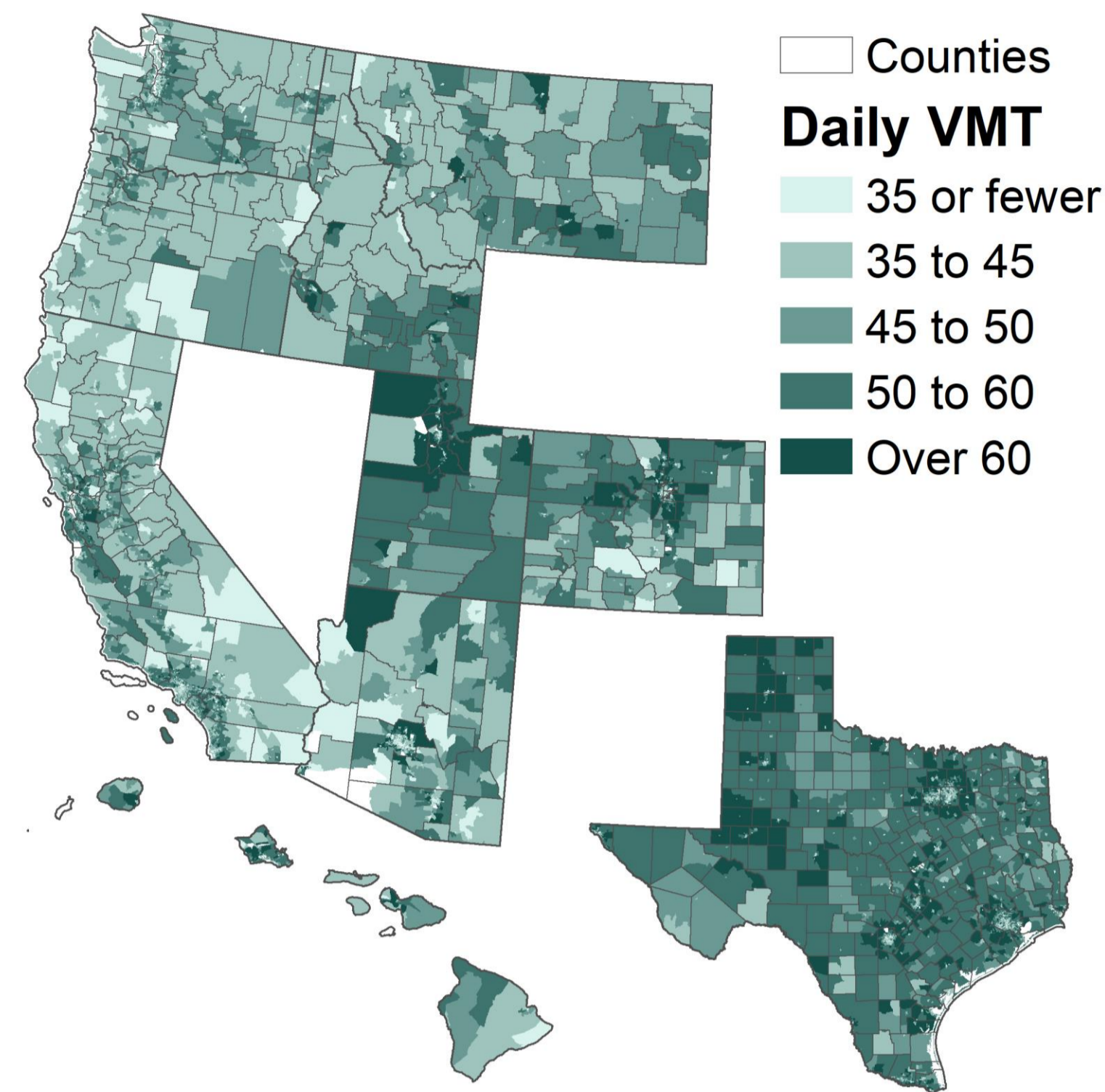
Background

Motivations for considering road usage charges

- Fuel excises taxes represent most states primary transportation revenue source
- Revenues are forecast to decline due to improving fuel economy of gasoline vehicles and increasing penetration of alternative fuels (especially electricity)
- Wide range of fuel economy options in new vehicle fleet lead to disparities in amount paid for a given level of road usage

Study objectives and purpose

- Two studies for the Western Road Usage Charge Consortium (RUC West)
- Primary emphasis on distributional effects for rural households, which are frequently expected to be disadvantaged by a new revenue regime
- Required a methodology that was repeatable and generalizable across states using commonly available data



Core Results

Travel behavior

- Household VMT is highest for “mixed” tracts, but in most states average daily VMT for urban tracts is similar to or greater than average daily VMT in rural tracts due to shorter but considerably more trips.
- Study states fall across three different census regions and exhibit large ranges in driving behavior. Of course there is even more heterogeneity within tracts.

Transportation revenue contribution

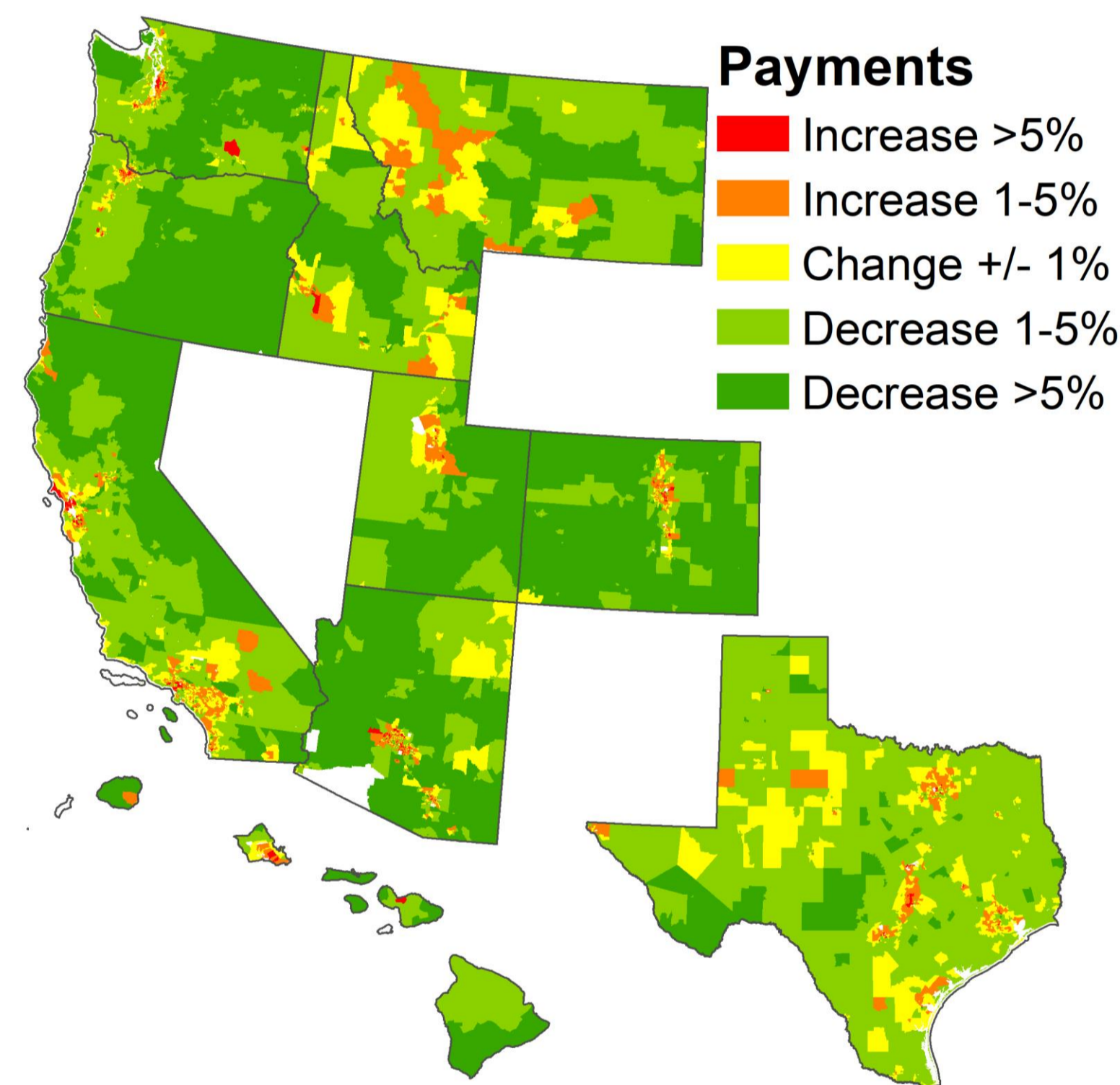
- Vehicle fuel types and fuel efficiency were estimated for each census tract
- Combining NHTS travel estimates with this data yields fuel consumption and current fuel excise tax payments.
- Only state-level travel surveys have previously provided enough detail for this level of household payments analysis.

Data Fusion Methodology

Because travel behavior varies considerably across counties (the most common geography for urban and rural classifications), a key component of the distributional analysis was classification of geography at a census tract level and assembling corresponding data about travel behavior and vehicle characteristics.

NHTS Usage

- Many prior studies utilized NHTS vehicle and trip sample records to estimate RUC effects. However, most states contain insufficient sample sizes for this to provide the resolution required.
- The 2009 NHTS Transferability Statistics provide regression coefficients for tract level travel behavior estimation at the household level. Complete registration records were then joined to these estimates at the census tract level.



Distributional Effects & Parameters

Who benefits from a RUC?

- Almost all tracts’ average changes are small. Increases are concentrated in more urban places.
- Most revenue under current policy comes from urban areas, so mean increases are very small and mixed and rural savings are larger.
- There’s lots of variation around statewide average changes.

RUCs beyond simple mileage-based fees

- Second study considered other potential parameters including congestion, fuel type, vehicle weight, and fuel efficiency.
- Providing rates based on fuel efficiency percentiles can make RUC incidence more similar to a gas tax and reduce how much variation there is between tracts.
- The NHTS-ACS-vehicle data fusion allows testing many different revenue policies and looking at many different dimensions of equity.

Geographic Classification

- Census urban areas data
- USDA Rural-Urban Commuting Area (RUCA) codes

NHTS Travel Patterns

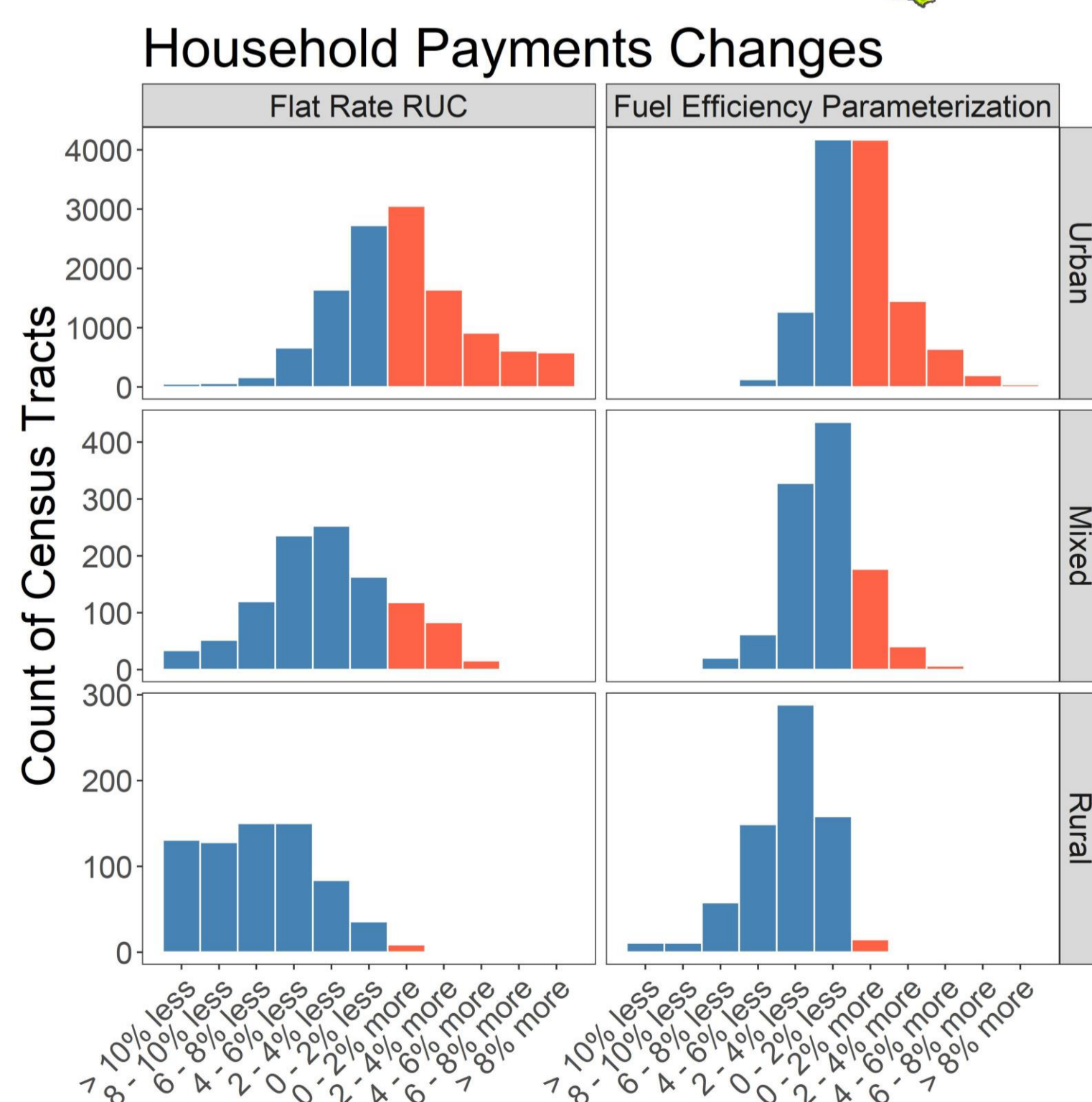
- BTS Transferability Statistics
- American Community Survey
- Validation to state data

Vehicle Characteristics

- State vehicle registration data
- NHTSA vPICs tools
- EPA FuelEconomy.com databases

Revenue Policy

- Tax rates across fuel types
- Bottom-up estimates of fuel tax payments
- Revenue neutral RUC rate estimates



Conclusions and Lessons

RUC policies would not have the disproportionate adverse impact on rural drivers feared by the public (due to different driving and vehicle ownership patterns).

2017 NHTS Transferability Statistics should offer an important tool to states interested in evaluating different revenue policies who can’t build on their own statewide surveys or NHTS oversamples.

Although survey responses and statistical analysis only provide an imperfect resolution, a lot of insight is possible across and within states for policymakers.

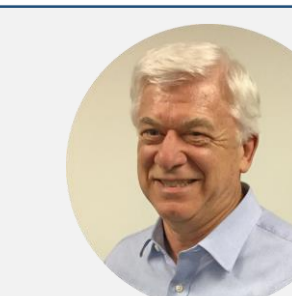
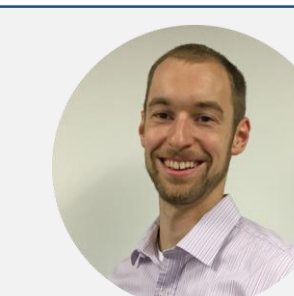
Good registration records and access for research purposes is essential to being able to address the vehicle-driven impacts of revenue policy on households.

Most work to date only includes household passenger vehicles, but commercial vehicles make up a significant portion of fuel tax revenue in many states and requires more research.



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