Simulation of Equity of Transportation Revenue Options for Households

Client

The Eastern Transportation Coalition

Facts

Period 2023

Project Country United States

For North Carolina, Pennsylvania, and New Jersey, EBP completed detailed data modeling that helped show how changes in revenue policy might shift the burden between households.

This modeling built on prior analysis of geographic patterns of transportation revenue burden to examine racial, ethnic, and income groups. Other household characteristics were also considered in the modeling to better estimate travel behavior and vehicle ownership patterns.

The framework provided insights about how current policy affects different groups, as well as how policy proposals could affect households. It found that changing from current fuel tax policies to a mileage-based user fee policy would have very small effects on changes in payments across racial/ethnic or income groups (much smaller than the shifts between geographic groups, which also amount to only about $2 per month on average).

In general, shifting to a system usage-based fee from a fuel consumption-based fee lowers the burden on rural households in all states (including over 20 other states EBP has examined in other studies). These effects are much less pronounced and consistent across states when examining race and income. This is because race and income are even less useful predictors of vehicle choice than geographic setting. Because this study simulated millions of households behavior and vehicle choice, it was able to clearly demonstrate that individual preferences for vehicle types, diverse travel patterns, and non-socioeconomic factors will have a much greater impact on household payment change than categorization in specific groups of interest.

This project relied on synthetic household population generation using American Community Survey summary tables and public use microdata, ownership modeling using vehicle preferences revealed by the 2017 National Household Travel Survey (NHTS), travel behavior estimation using NHTS (or NC DOT vehicle data), probabilistic matching between registered vehicles and households based on preferences, and dozens of simulations runs to examine the variability created by uncertain preferences in vehicle matching. This work builds on prior tract-level analysis of households for TETC and others and the methods are current being applied for Oregon and Delaware to examine these household characteristics in other settings.

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