

GASOLINE SUPERUSERS 2.0

Supporting Gasoline-Burdened Families' Transition
to EVs to Maximize Climate and Equity Benefits



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I. Executive Summary

Burning gasoline in our cars, trucks and SUVs is a primary source of carbon emissions. Unless we change our approach, gasoline consumption will not decline quickly enough to meet climate goals.

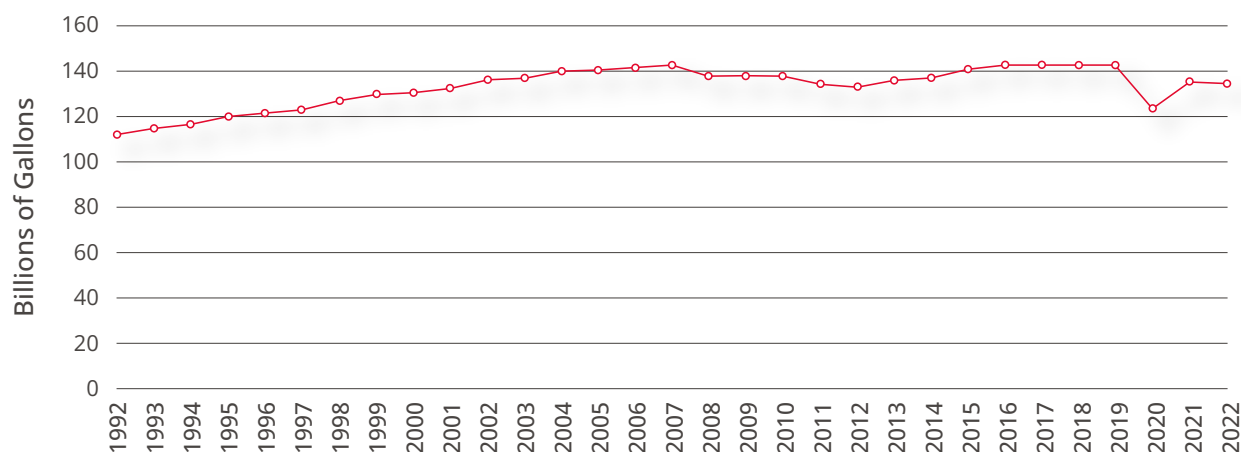
Prioritizing the biggest gasoline users (“Gasoline Superusers”) for the switch to electric vehicles (EVs) is critical to cut gasoline use at the speed and scale required by the climate crisis. This strategy would enable meeting gasoline reduction targets faster and with fewer total EVs. It would also better support lower-income households that are most burdened by gasoline expenditures.

This report uses millions of California vehicle records and other datasets to build on Coltura’s first Gasoline Superusers report. Along with the interactive gasoline consumption map, gasoline data center and EV cost savings calculator released in conjunction, this report illuminates for the first time the geographic, demographic, financial, and vehicular details of consumer gasoline use down to the zip code level, enabling policymakers and businesses to develop more effective gasoline displacement policies and investments.

The Challenge

Scientists warn that we must cut global carbon emissions from all sources roughly in half by 2030 to avoid the worst impacts of climate change.¹ Carbon emissions from the U.S. transportation sector increased 13.8% from 2020 to 2021.² Gasoline consumption, the source of one-sixth of U.S. carbon emissions, has rebounded after the pandemic and is close to all-time highs.

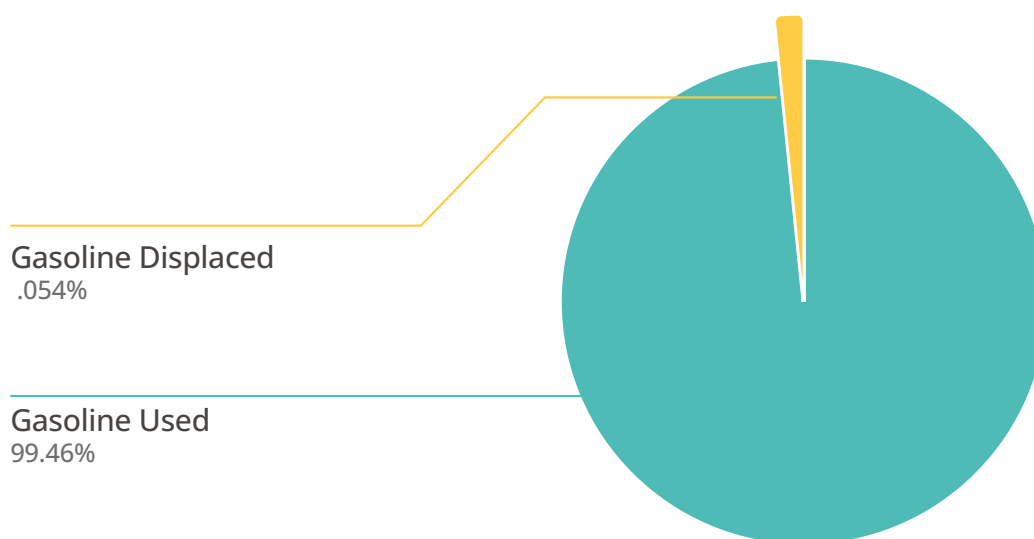
U.S. Gasoline Consumption Near All-time High



US Gasoline consumption 1992-2022. Source: EIA

Electric vehicles (EVs) have barely made a dent in gasoline consumption. In 2021, the 2.24 million EVs on US roads reduced total U.S. gasoline use by just 0.54%.

US Gasoline Displaced by EVs in 2021 (of 135 billion gallons total)



Source: Argonne National Labs

Nationally, gasoline reductions are not on track to meet the Biden Administration's goal of cutting GHG emissions 50-52% by 2030.⁵

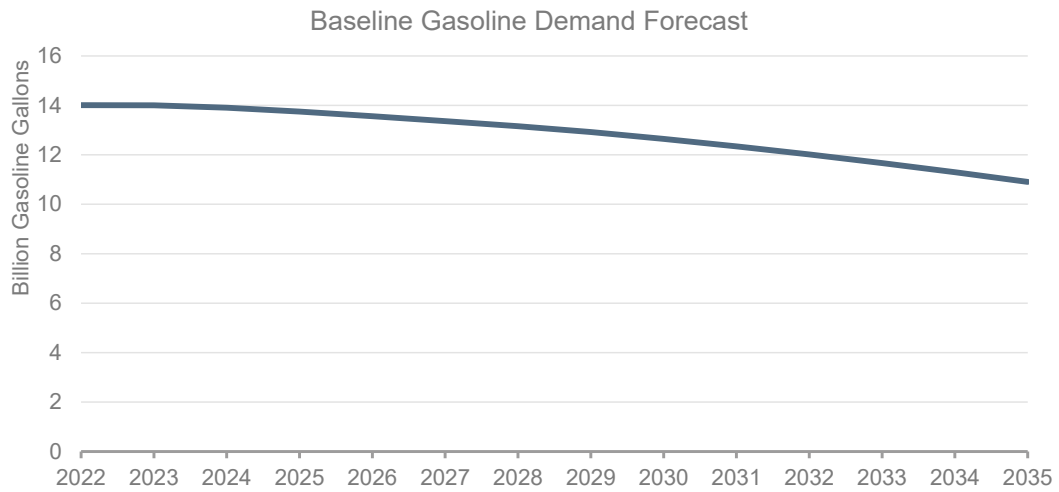
In California, to meet statutory emissions reduction targets,⁶ the California Air Resources Board (CARB) calls for a 50% cut in gasoline use from 2021 to 2030.⁷ But the state is forecast by California Energy Commission (CEC) staff to decrease gasoline consumption just 10% by 2030 – far short of the 50% goal.⁸

We need to cut gasoline use faster.

California Energy Commission Forecasts Only 10% Drop in Gasoline Demand by 2030



Gasoline



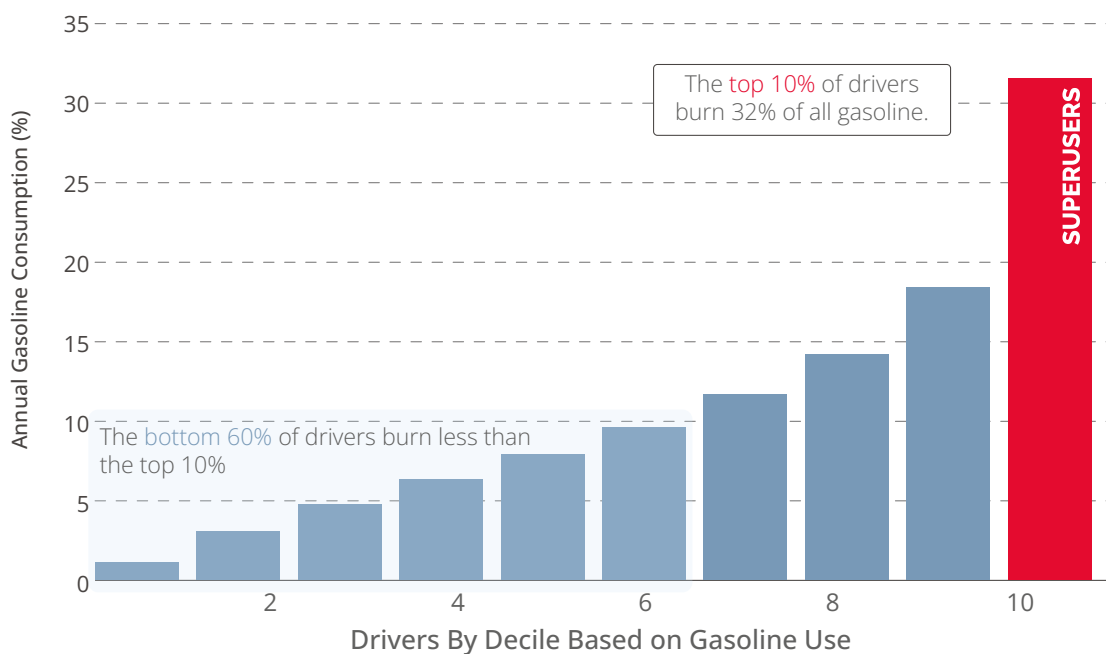
California Energy Commission Staff Report, Transportation Energy Demand Forecast, Dec 7, 2022, slide 10



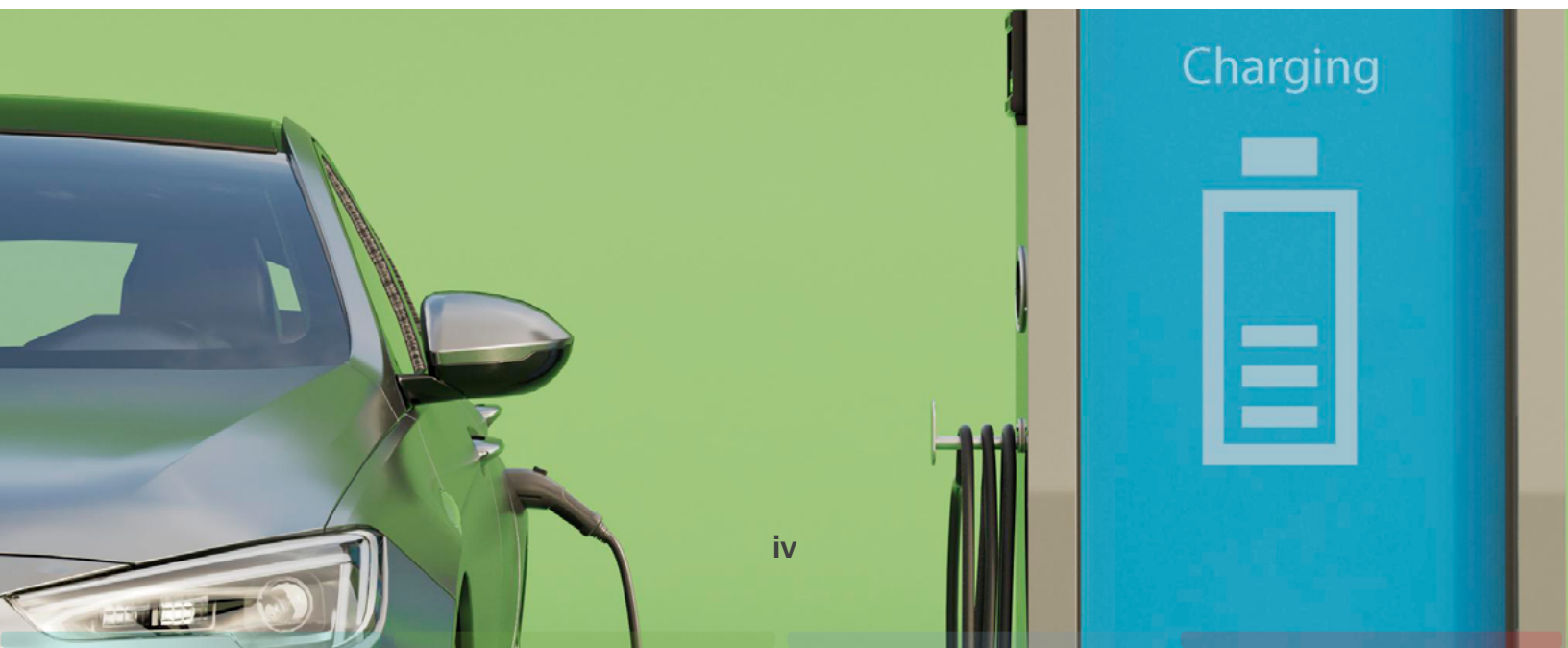
The Superusers Approach to Cutting Gasoline Consumption

Coltura's 2021 [Gasoline Superusers report](#) introduced the concept of prioritizing the biggest users of gasoline for conversion to EVs. Working with data from the 2017 National Household Travel Survey, Coltura found that US drivers in the top 10% for gasoline use, or "Gasoline Superusers," use 32% of the gasoline consumed by light duty vehicles.

Superusers Burn 32% of US Gasoline



US drivers divided into deciles based on gasoline consumption. Source: National Household Travel Survey, Coltura analysis.



The Need for Data-Driven Policy Focused on Gasoline Reduction

In the coming years, federal and state governments will invest tens of billions of dollars to help consumers buy EVs and support the construction of EV charging and grid infrastructure. These investments are not linked to specific near-term goals and plans for cutting gasoline use. Moreover, they are not closely tracking the emissions impact of each EV adopted, incorrectly assuming that all EVs displace equal amounts of gasoline.

Public investments in EV, transportation, public education, and grid upgrades are not optimized for gasoline reduction, in large part because detailed information about gasoline use is lacking. As management expert Peter Drucker famously said, “If you can’t measure it, you can’t manage it.”

The starting point for better policies to maximize gasoline cuts and equity benefits achievable from EVs is to understand how gasoline is used in granular detail.

Superusers 2.0: Gasoline Consumption in Unprecedented Detail

This report, along with the gasoline maps and data center released in conjunction, builds on the first Superusers report. It employs new vehicle datasets to illuminate for the first time the geographic, demographic, financial, and vehicular details of consumer gasoline use down to the zip code level.

The report’s findings are based on California data. While California has by far the most EVs of any state, more than 95% of light duty vehicles on its roads are still powered by gasoline. As such, California’s gasoline consumption patterns are broadly similar to national ones.⁹

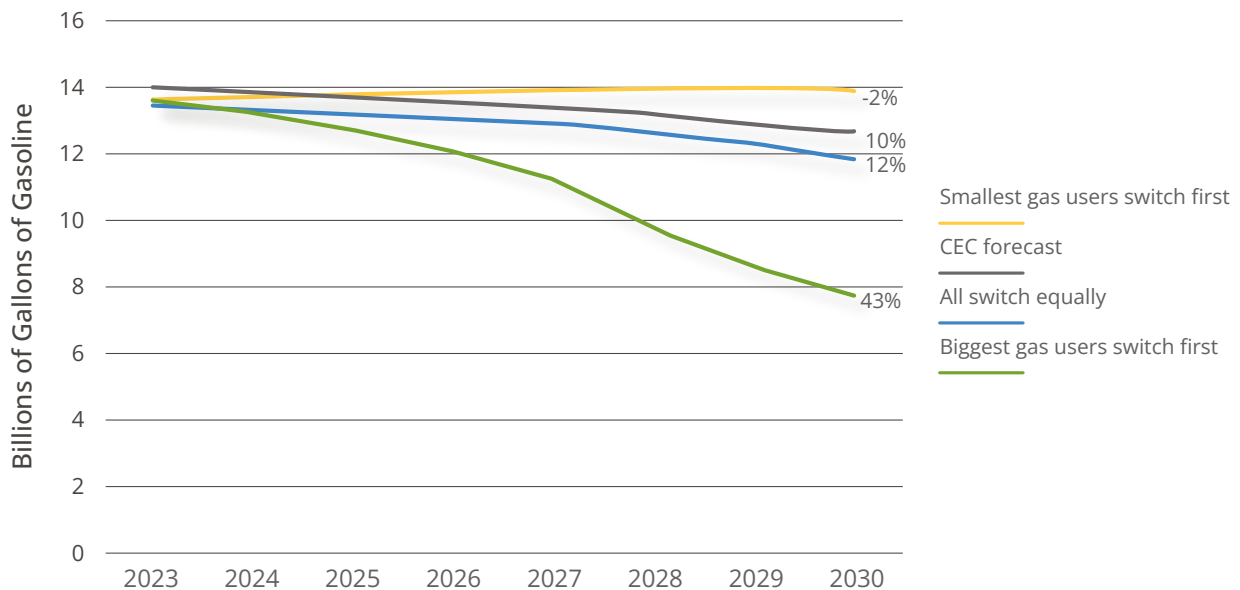
Benefits of Data-Driven Superuser Approach

Prioritizing Superusers' switch to EVs has three principal benefits:

1. Climate: Reduces gasoline consumption faster than current policies

The top 10% of California drivers consume 28% of the gasoline used in the state – more than the bottom 56% combined. A Superuser burns 3.5 times more gasoline per year than a non-Superuser on average – 1,260 gallons vs. 354 gallons. Switching Superusers to EVs first maximizes gasoline displacement and improves chances of meeting carbon reduction goals, as illustrated by the green line on the graph below:

Decrease in Gasoline Use Depends Upon Who Switches to EVs First

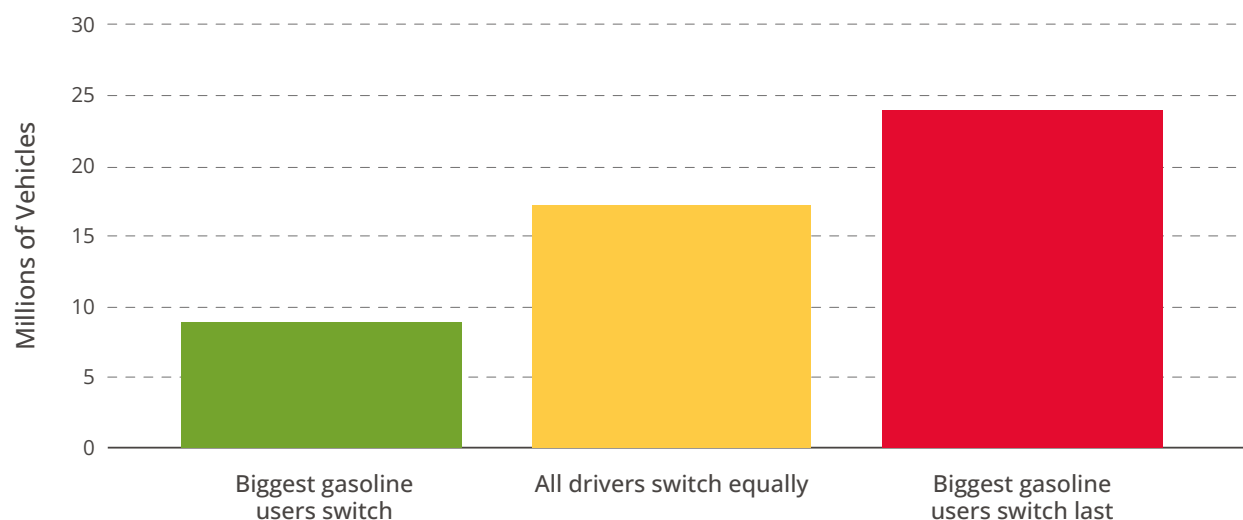


California Gasoline Demand Forecast. Each line assumes 5.24 million battery electric vehicles and 21.78 million gasoline powered light duty vehicles on the road by 2030, in accordance with the California Air Resources Board's (CARB's) 2030 plan and consistent with California's Advanced Clean Cars II (ACC II) sales requirements. Vehicle Miles Traveled (VMT) is assumed to stay constant. The yellow line scenario assumes that the smallest gasoline users are the first to shift to EVs. The blue line scenario assumes that all levels of gasoline consumption shift to EVs at the same rate. This scenario is roughly consistent with the CEC gasoline consumption forecast represented by the gray line. The green line scenario assumes that the biggest users of gasoline shift to EVs first. Source: Coltura analysis, CEC forecast.

The Superuser approach also requires fewer total EVs on the road to achieve emissions goals. In California, cutting vehicle emissions by 50% would only require 9 million EVs on the road if the biggest gasoline users switched to EVs first, versus 24 million EVs if the biggest gasoline users switched last.

Assuming a gas price of \$5.08/gallon, California Superusers collectively spend \$20 billion a year on gasoline. Prioritizing their switch to EVs maximizes the amount of money redirected from gasoline spending to spending on EVs, EV charging, and cleaner energy – which further accelerates the EV transition.

Fewer EVs to Reach 50% Emissions Cut if Biggest Gasoline Users Switch First

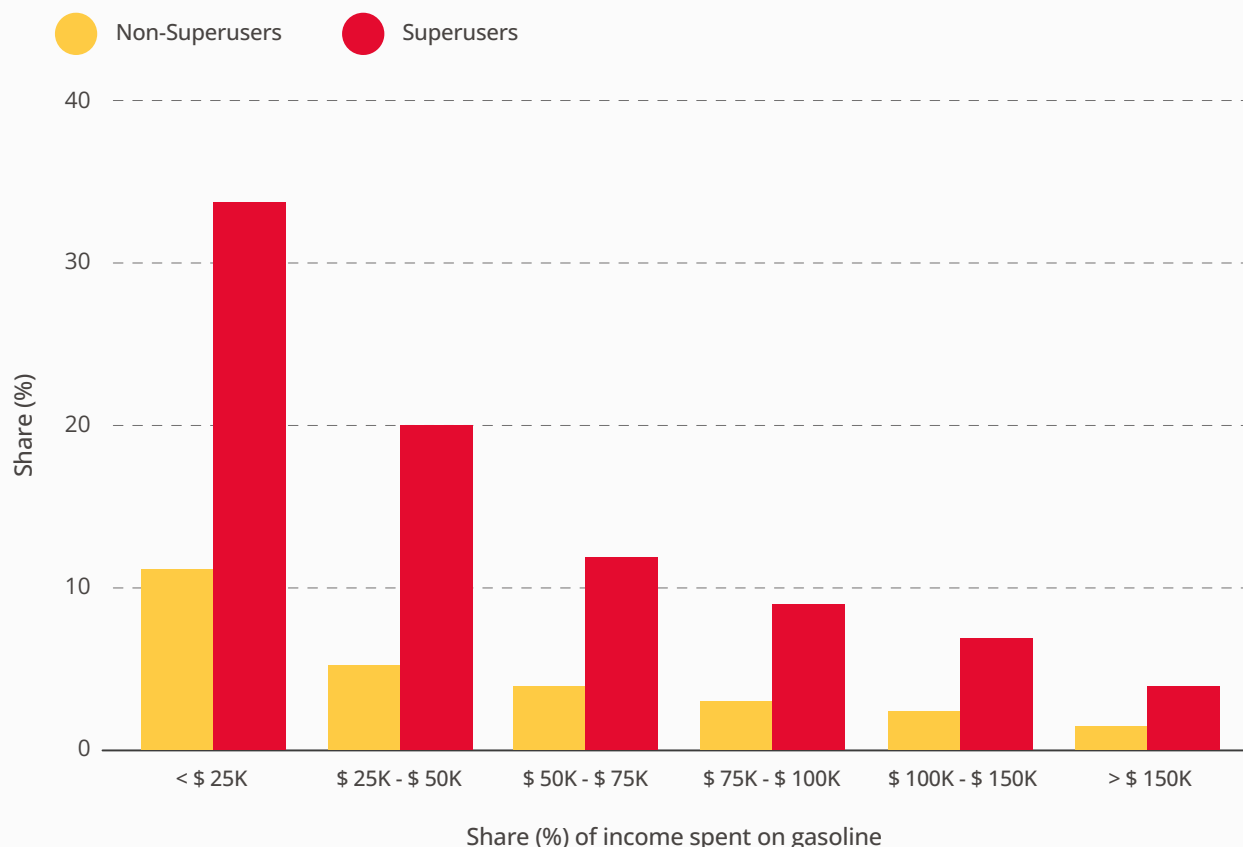


Millions of gas-powered vehicles that must switch to EVs to achieve a 50% cut in California vehicle emissions. Source: Cultura LDV, Gasoline, Energy & Emission Forecast Model.

2. Equity: Helps lower-income Superusers see the greatest relative financial benefit

The majority of Superuser households (56%, or about 424,000 households) are below the median household income level of approximately \$100,000. Helping them switch to EVs delivers financial benefits that are especially meaningful. At every income level, Superusers spend a larger portion of household income on gasoline than non-Superusers. At below-median income levels, this difference is the greatest.

Superusers Spend Larger Share of Household Income on Gasoline



Comparison of Superuser and non-Superuser percent of household income spent on gasoline across various median household income brackets. Source: Transportation Secure Data Center. (2019). National Renewable Energy Laboratory. Accessed 3/12/2023: www.nrel.gov/tsdc ("2019 California Vehicle Survey"); Coltura analysis.

Superusers below the median income of approximately \$100,000 a year spend on average 15% of their household income on gasoline alone, and 24% on gasoline plus vehicle maintenance and repairs.

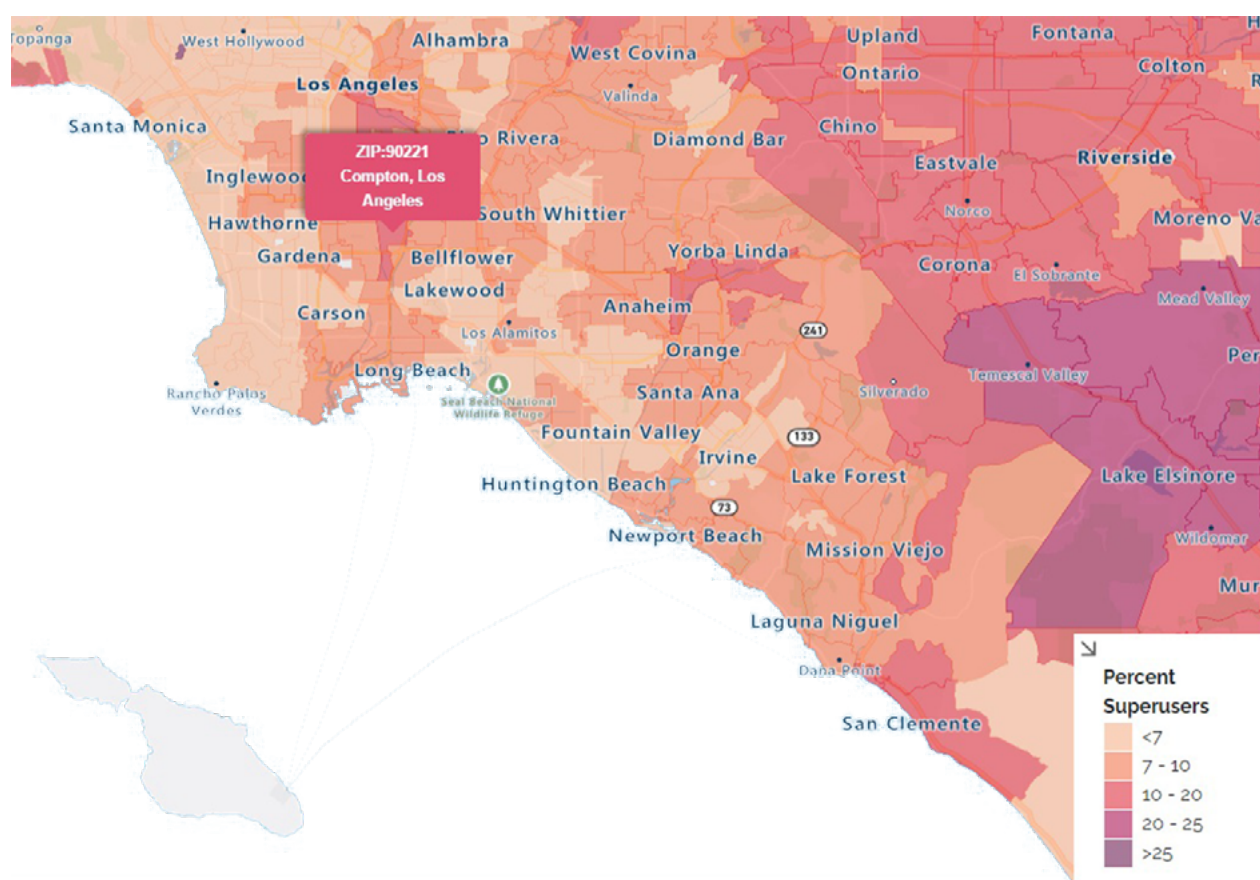
For lower-income Superusers, unexpected car repairs can cause financial shocks and work interruptions – especially for drivers who have no other option than to use large amounts of gasoline for long commutes or for their work. These drivers also suffer acutely when gasoline prices spike.

Helping lower income Superusers switch to EVs protects them from these risks by shifting their vehicle costs from volatile fuel and maintenance expenses to more predictable EV financing payments and electricity prices.

3. Efficiency: Supports data-driven gasoline displacement policies, investment, program design, and measurement

Granular data on consumer gasoline use enables setting and measuring progress toward gasoline reduction goals. This data provides gasoline consumption baselines at the zip code level, so that cities and counties can track changes in gasoline consumption over time, and adopt best practices of jurisdictions cutting gasoline consumption rapidly.

Zip-Code Level Heatmap Colored by Percent Superusers: Details for Zip Code 90221



Superuser map of Los Angeles area by zip code. Source: DMV and BAR data, Coltura.

This data also helps policy makers and businesses understand how to prioritize Superusers for incentives, outreach, education, and marketing, by providing zip-code level details such as concentration of Superusers, the makes and models of Superuser vehicles, Superuser percent of income spent on gasoline, and quantity of gasoline used.

Superusers 2.0 Findings

This report uses millions of vehicle records and other datasets to explore the factors driving consumer gasoline consumption and proposes targeted policies and investments to reduce gasoline consumption more quickly, equitably and efficiently than existing policies.

It makes the following findings:

Prioritizing Superusers maximizes gasoline displacement impact of EVs

- California Superusers burn 28% of the gasoline used by consumers in light duty private vehicles – more than the bottom 56% of gasoline users combined.
- The average Superuser burns 3.5x more gasoline than the average non-Superuser: 1,260 gallons a year vs. 354 gallons for non-Superusers.
- Switching all of California's 5.4 million biggest gasoline users (roughly those in the top 20%) to EVs would cut gasoline use by 43%.
- Cutting vehicle emissions by 50% would require 9 million EVs if the biggest gasoline users switched first, but 24 million EVs if the biggest gasoline users switched last.
- Currently, EVs are being adopted by lower mileage drivers. The average EV driver only drives about 10,200 miles a year versus superusers who drive on average 24,000 miles a year.

Lower-income Superusers see the greatest relative financial benefit from shifting to EVs

- The majority of California's Superuser households (56%) are below the median household income.
- Superusers spend on average around \$500/month on gasoline and around \$300 a month on vehicle maintenance and repairs.
- Lower-income Superuser households spend on average around 15% of household income on gasoline and an additional 9% on vehicle maintenance and repairs.
- Switching to an EV shifts volatile fuel and maintenance costs, which are highly destabilizing for lower-income Superusers, to more predictable electricity and financing expenditures.

Many Superusers are able and willing to switch to EVs

- California Gasoline Superusers surveyed generally have positive attitudes towards EVs with 66% surveyed feeling "positive" or "very positive" about EVs.
- Nearly one-quarter of Superusers surveyed reported an intention to replace their gas vehicle with an EV in the next 12 months; 73% within the next 4 years.
- More than 64% of Superusers live in single family homes with off-street parking amenable to level 2 charging.
- 39% of Superusers drive cars, for which there are multiple similar EV models widely available. For the 54% that drive trucks and large SUVs, more electric models are on the near horizon.
- Many Superusers spend so much on gasoline and vehicle maintenance that they could break even or save on monthly costs by trading in their gas car for an EV – even with a monthly EV car payment.

Data enables setting and measuring progress toward gasoline reduction goals, and prioritizing Superusers for outreach, education, and marketing

- Using this report data, gasoline consumption, numbers of Superusers and vehicle types can be tracked to the zip code level.
- Rural areas have twice as many Superusers per capita as urban areas.
- Areas on the fringes of major metropolitan areas tend to have higher concentrations of Superusers.
- Areas with high concentrations of Superusers tend to have low rates of EV adoption, and areas with high rates of EV adoption tend to have low concentrations of Superusers.

Superuser grid planning

- A Superuser switching to an EV will require about three times more electricity from the electric grid than an average non-Superuser switching to an EV.
- An EV driven by an average Superuser would require roughly 9,000 KWh per year – about 30% more electricity than an average California household uses for all purposes.

Superusers 2.0 Policy Recommendations

In light of these findings, the report makes the following policy recommendations:

1. Gasoline reduction should be established as a primary climate goal and metric by governments at federal, state, and local levels.
2. Governments should prioritize transitioning Superusers to EVs – especially those Superusers who are lower-income.
3. Gasoline consumption and demographic data at the most detailed level available should be used to inform gasoline reduction and EV policies, investments, outreach and communications.
4. Governments should foster public-private multi-stakeholder collaborations to support Superusers' switch to EVs.
5. Governments and businesses should prioritize electrification of their fleet vehicles that use the most gasoline.