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Total Cost of Ownership

- Vehicle efficiency and fuel switching can reduce fuel costs

Fuel Cost Comparison (new SUV, 2025)

- Comprehensive Total Cost of Ownership
  Quantification for Vehicles with Different Size Classes and Powertrains

https://www.osti.gov/biblio/1780970
Total Cost of Ownership

- Vehicle efficiency and fuel switching can reduce **fuel costs**
- More efficient technologies often have higher **upfront costs**

Vehicle and Fuel Cost Comparison (new SUV, 2025)

- Vehicle efficiency and fuel switching can reduce fuel costs
- More efficient technologies often have higher upfront costs

https://www.osti.gov/biblio/1780970
Total Cost of Ownership

- Vehicle efficiency and fuel switching can reduce **fuel costs**
- More efficient technologies often have higher **upfront costs**
- Comprehensive TCO should consider all **operating expenses**

![Levelized Cost of Driving Comparison (new SUV, 2025)](https://www.osti.gov/biblio/1780970)
Total Cost of Ownership

- Vehicle efficiency and fuel switching can reduce **fuel costs**
- More efficient technologies often have higher **upfront costs**
- Comprehensive TCO should consider all **operating expenses**
- As new technologies mature, costs tend to come down

Levelized Cost of Driving Comparison (new SUV, 2025)

https://www.osti.gov/biblio/1780970
Levelized Cost of Driving for Aging Vehicles

- Large spike in expenditures in first year because of depreciation and sales taxes
- Gradual growth in M&R as vehicle ages counters decreasing depreciation for ICEV
- Potentially lower costs for BEV… if you can get one

Starting around year 7 (e.g. second owner), cost of purchasing and operating BEV cheaper than ICEV
Household Transportation Energy Affordability

- We quantified transportation energy cost burden for each community in the United States, based on local fuel costs and driving behavior.

Cost Burden = \( \frac{\text{Cost}}{\text{Income}} = \frac{\text{\$/gallon} \times \text{miles} \times \text{household}}{\text{\$/year} \cdot \text{household}} \)

Consider spatial variation of cost burden and distributions across communities.
Household Transportation Energy Affordability

- We quantified transportation energy cost burden for each community in the United States, based on local fuel costs and driving behavior.

\[ \text{Cost Burden} = \frac{\text{Cost}}{\text{Income}} = \frac{\$/\text{gallon} \times \text{mile}}{\text{gallon} \times \text{mile} / \text{household} \times \text{year} \cdot \text{household}} \]

https://www.osti.gov/biblio/1760477

Consider spatial variation of cost burden and distributions across communities.
Household Transportation Energy Affordability

- We quantified **transportation energy cost burden** for each community in the United States, based on local fuel costs and driving behavior.

Cost Burden = \[
\frac{\text{Cost}}{\text{Income}} = \frac{\$ \text{gallon} \times \text{gallon}}{\text{mile} \times \text{mile} \times \text{household}} \times \frac{\text{year} \times \text{household}}}
\]

Consider **spatial variation** of cost burden and distributions across and within communities.
Household Transportation Energy Affordability

- We quantified transportation energy cost burden for each community in the United States, based on local fuel costs and driving behavior.
  - Expanding analysis to total cost of ownership, including depreciation, insurance, maintenance & repair.

Cost Burden = \[ \frac{\text{Cost}}{\text{Income}} = \frac{\$}{\text{gallon}} \times \frac{\text{gallon}}{\text{mile}} \times \frac{\text{mile}}{\text{household}} \times \frac{\$}{\text{year} \cdot \text{household}} \]

- gohlke@anl.gov
- https://www.anl.gov/es/transportation-energy-equity-analysis-and-resources
Key Research Results


Per-Mile Cost of Ownership, Gasoline ICE, Small SUV, MY2025

1: [https://www.osti.gov/biblio/1780970](https://www.osti.gov/biblio/1780970)
2: [https://www.osti.gov/biblio/1760477](https://www.osti.gov/biblio/1760477)
3: [https://www.osti.gov/biblio/1876197](https://www.osti.gov/biblio/1876197)