

## OVERVIEW

Transportation is responsible for about 29% of total U.S. GHG emissions, mostly in the form of carbon dioxide emitted from the tailpipes of cars, trucks, buses, ships, and airplanes.<sup>1</sup> Within the transportation sector, cars and light-duty personal trucks (SUVs and pickups) account for 58% of emissions, medium- and heavy-duty trucks account for 24% of emissions, aviation accounts for 10% of emissions, rail accounts for 2% of emissions, and ships and boats account for another 2% of emissions.<sup>2</sup> Driving is the dominant mode of travel in the U.S, and single-occupancy vehicles (a car trip where the driver is the only passenger) account for 42% of all person-trips per year.<sup>3</sup> A typical passenger vehicle emits about 4.6 metric tons of carbon dioxide per year.<sup>4</sup>

Climate solutions in the transportation sector fall into two categories:

- Those that reduce the total amount of externally powered energy required to move people and goods, for example by enabling/encouraging people to travel less (e.g., through telecommuting and virtual conferences), enabling/encouraging people to travel together (e.g., by carpooling or using public transit), enabling/encouraging people to travel under their *own* power (e.g. by bicycling or walking), or by making conventional fuel vehicles more efficient so that they emit a smaller volume of GHG emissions per mile driven; and
- Those that replace fossil fuels with *alternative* fuels, including electricity, hydrogen, biogas, or biofuels. Not all alternative fuels are emissions-free, and even those that are, such as electricity and hydrogen, can be produced by processes that emit GHGs.

In the U.S., fuel efficiency and alternative fuel adoption are promoted through the Corporate Average Fuel Economy standards. First established by Congress in 1975 as part of the Energy Policy and Conservation Act, and later amended as part of the Energy Independence and Security Act of 2007, the standards are set by the Department of Transportation for passenger vehicles and light trucks. Each standard, expressed in miles per gallon, applies to a model-year class of vehicles from each manufacturer's fleet. The weighted average by vehicles sold by each manufacturer must meet specific levels that are determined based on the characteristics and mix of vehicles produced by each manufacturer. Manufacturers failing to meet the standards must pay a penalty.<sup>5</sup> Manufacturers can meet their obligations by engineering vehicles to run further on less fuel and by increasing the proportion of alternative fuel vehicles in their

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<sup>1</sup> EPA. "Carbon pollution from transportation." <https://www.epa.gov/transportation-air-pollution-and-climate-change/carbon-pollution-transportation>

<sup>2</sup> EPA. Fast facts on transportation greenhouse gas emissions. <https://www.epa.gov/greenvehicles/fast-facts-transportation-greenhouse-gas-emissions>

<sup>3</sup> U.S. Department of Transportation Federal Highway Administration (2019). *Status of the nation's highways, bridges, and transit*. <https://www.fhwa.dot.gov/policy/23cpr/chap3.cfm>

<sup>4</sup> EPA. Greenhouse gas emissions from a typical passenger vehicle. <https://www.epa.gov/greenvehicles/greenhouse-gas-emissions-typical-passenger-vehicle>

<sup>5</sup> Wikipedia. "Corporate average fuel economy." [https://en.wikipedia.org/wiki/Corporate\\_average\\_fuel\\_economy](https://en.wikipedia.org/wiki/Corporate_average_fuel_economy)

sales portfolios. Among other factors, technological development in electronics (e.g., sensors, computers, and integrated circuits) have made vehicles much more fuel-efficient in recent years.<sup>6</sup>

“Alternative fuels” are defined under the Energy Policy Act of 1992, which prescribes both regulatory and voluntary activities, including requirements for federal, state, and alternative fuel provider fleets to acquire alternative fuel vehicles. Alternative fuels recognized under the act include: methanol, ethanol, and other alcohols; blends of 85% or more of alcohol with gasoline (E85); natural gas and liquid fuels domestically produced from natural gas; propane; hydrogen; electricity; biodiesel (B100); coal-derived liquid fuels; fuels, other than alcohol, derived from biological materials; and P-Series fuels.<sup>7</sup> The Renewable Fuel Standard, which was first enacted as part of the Energy Policy Act of 2005 and later expanded by the Energy Independence and Security Act of 2007, requires a certain volume of renewable fuels (divided into conventional biofuels, cellulosic biofuels, biodiesel, and other advanced fuels) to be blended into transportation fuels. This volume is set to increase each year, and is at 36 billion gallons by 2022.<sup>8</sup>

A holistic approach to transportation solutions can help optimize climate gains and co-benefits while reducing costs and environmental externalities. For instance, although alternative fuel vehicles (especially EVs) are becoming more mainstream, some observers caution saying that simply swapping out internal combustion engines for batteries or petroleum-based fuels for biomass-based or other alternative fuels does little to address the inequities and environmental externalities associated with lopsided reliance on private vehicles for personal mobility.<sup>9</sup> EV battery production is associated with lifecycle GHG emissions, and biofuel production is associated with impacts to land use, food production, and waterways. Meanwhile, continued reliance on private vehicles and single-occupancy trips perpetuates the environmental impacts of roads, such as runoff, impervious surfaces, urban heat island effects, loss of natural land due to sprawl, and the intense lifecycle GHG emissions associated with concrete and pavement production.<sup>10</sup>

The overwhelming reliance on private automobiles for transportation in the U.S. is not the inevitable result of some inherent superiority, but is rather the result of policy choices and path dependency that make driving the easiest – if not the only – transportation option available to many people.<sup>11</sup> Many experts stress that support for the electric and efficient vehicles must be

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<sup>6</sup> The National Academy of Sciences, Engineering, and Medicine. “CAFE standards.”

<http://needtoknow.nas.edu/energy/energy-efficiency/cale-standards/>

<sup>7</sup> DOE Alternative Fuels Data Center. “Key federal legislation.” [https://afdc.energy.gov/laws/key\\_legislation](https://afdc.energy.gov/laws/key_legislation)

<sup>8</sup> DOE Alternative Fuels Data Center. “Renewable Fuel Standard.” <https://afdc.energy.gov/laws/RFS>

<sup>9</sup> SmartGrowth America. 2020. *Driving Down Emissions: Transportation, Land Use, and Climate Change*.

<https://smartgrowthamerica.org/wp-content/uploads/2020/10/Driving-Down-Emissions-FINAL.pdf>

<sup>10</sup> SmartGrowth America. 2020. *Driving Down Emissions: Transportation, Land Use, and Climate Change*.

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<sup>11</sup> SmartGrowth America. 2020. *Driving Down Emissions: Transportation, Land Use, and Climate Change*.

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accompanied by policies that allow Americans to drive less, such as public transit and investment in “complete streets,” defined as streetscapes that give equal priority to safe and enjoyable walking, biking, assisted mobility, and public transit as they do to cars.<sup>12</sup>

- More information:
  - [EPA: Carbon pollution from transportation](#)
  - [RFF: Federal climate policy 104: The transportation sector](#)
  - [SmartGrowth America \(2020\). \*Driving down emissions\*.](#)
  - [SmartGrowth America: National Complete Streets Coalition](#)
  - [DOE Alternative Fuels Data Center: Key federal legislation](#)
  - [DOE Alternative Fuels Data Center: Federal laws and incentives](#)

Continue reading at <https://fisheryfriendlyclimateaction.org/solutions>

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<sup>12</sup> SmartGrowth America. “What are complete streets?” <https://smartgrowthamerica.org/program/national-complete-streets-coalition/publications/what-are-complete-streets/>