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# Climate Change and the America's Transportation Infrastructure Act of 2019 (S. 2302)

Highway, public transportation, and rail programs are authorized through FY2020 by the Fixing America's Surface Transportation (FAST) Act (P.L. 114-94). In August 2019, the Senate Committee on Environment and Public Works reported a bill that would reauthorize the highway elements of surface transportation programs from FY2021 through FY2025. The bill, S. 2302, the America's Transportation Infrastructure Act of 2019, would be the first surface transportation authorization act to include major provisions that address climate change.

Surface transportation is a major source of carbon dioxide ($CO_2$) in the atmosphere, the main human-related greenhouse gas (GHG) contributing to climate change. At the same time, the effects of climate change, such as extreme heat, sea level rise, and stronger storms, pose a threat to transportation infrastructure. S. 2302 seeks to address these two aspects of climate change with *mitigation* provisions that aim to reduce GHG emissions from surface transportation and *adaptation* provisions that aim to make the surface transportation system more resilient to a changing climate.

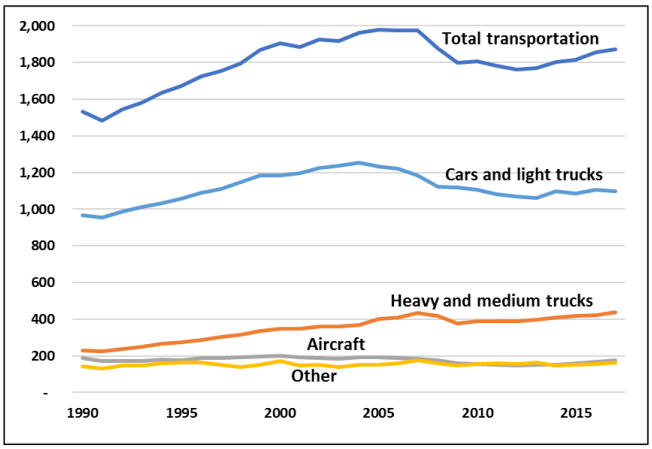
## Climate Change Mitigation

Transportation is the largest source of GHG emissions in the United States, and thus is a target of emission reduction efforts to mitigate future climate change. The Environmental Protection Agency (EPA) estimates that, in 2017, transportation accounted for 29% of U.S. man-made GHG emissions. GHG emissions from the transportation sector come mainly from cars and light trucks (**Figure 1**). Total GHG emissions from transportation increased by 22% between 1990 and 2017, but peaked in 2005. Total emissions were about 6% less in 2017 than in 2005, but have increased since 2012. Most GHG emissions from the sector are due to the release of $CO_2$ from the combustion of gasoline and diesel fuel. Other GHGs, such as methane, make up about 3% of emissions from transportation.

GHG emissions from transportation are largely a function of three factors: vehicle fuel efficiency, the carbon content of fuel, and vehicle miles traveled. Vehicle fuel efficiency is regulated by the Corporate Average Fuel Economy (CAFE) standards, administered by the Department of Transportation's National Highway Traffic Safety Administration, and GHG emissions standards, administered by EPA. The CAFE standards are established under the authority of the Energy Policy and Conservation Act, as amended, and the GHG standards under the authority of the Clean Air Act, as amended. Neither is commonly legislated in surface transportation authorizations.

**Figure 1. Greenhouse Gas Emissions from Transportation in the United States, 1990-2017**

Millions of metric tons of carbon dioxide equivalent




**Source:** Environmental Protection Agency.

**Note:** "Other" includes buses, motorcycles, ships and boats, rail, and pipelines.

Other climate mitigation policies affecting surface transportation are generally the indirect effects of policies enacted for other reasons. For example, the Congestion Mitigation and Air Quality Improvement (CMAQ) program, part of the Federal-Aid Highway Program, provides federal funding for projects that contribute to the attainment of ambient air pollution standards for ozone, carbon monoxide, and particulate matter. This typically involves projects that reduce pollutant emissions from cars and trucks that also co-emit $CO_2$. Other surface transportation programs that may contribute indirectly to the reduction of GHG emissions include the Transportation Alternatives program, which funds projects such as bicycle and pedestrian infrastructure, and the federal public transportation program.

## Climate Change Adaptation

Climate change is likely to include higher average temperatures, greater extremes of temperature, more precipitation overall with an increase in precipitation intensity and greater variation, and a rise in sea level. Climate change may also lead to fewer but stronger hurricanes. While the consequences of some of these changes may depend to some extent on other human activities, such as urban development patterns, they are likely to include an increase in extreme heat; fewer days below freezing; more coastal, riverine, and flash flooding; and more droughts and wildfires. Intense precipitation could lead to more mudslides, particularly following droughts and wildfires.

Existing surface transportation infrastructure can be vulnerable to climate change because it was constructed for sea level and weather extremes that are being or are likely to be exceeded in the future. If the effects of climate change worsen, as studies anticipate, the impacts of extreme weather on surface transportation infrastructure and operations are likely to increase in magnitude, duration, and frequency. For example, an increase in the number of very hot days may cause more damage to bridges because of greater thermal expansion of bridge joints. More intense precipitation and flooding could result in more road washouts, bridge scour, and roadside mudslides. Not all the effects of climate change will be negative. For example, a warmer climate could reduce road pavement deterioration in some places due to less freezing, snow, and ice.

Adaptation is action to reduce the vulnerabilities and increase the resilience of the transportation system to the effects of climate change. Adaptation options for surface transportation include structural and nature-based engineering and policy-based activities. For example, highway bridges can be engineered structurally to withstand the threats of higher wind and water. Nature-based engineering may involve reducing climate vulnerabilities through activities such as wetland restoration, artificial reefs, and beach restoration. Policy-based activities include changing maintenance practices, such as more frequent cleaning of drains, and improving operations plans for weather emergencies.

Currently, there is no dedicated surface transportation funding for adaptation projects. The Federal Highway Administration (FHWA) has stated that federal-aid highway funds can be used to assess the potential impacts of climate change and to apply adaptation strategies. FHWA's Emergency Relief program, which provides funds for rebuilding after natural disasters, also allows some spending on resiliency features. Moreover, several aspects of federal law, regulation, and policy require asset managers to consider the effects of climate change on surface transportation infrastructure. FHWA, in cooperation with state departments of transportation, has sponsored vulnerability assessments and conducted research into making surface transportation more resilient to climate change.

## America's Transportation Infrastructure Act of 2019 (S. 2302)

S. 2302 would authorize about $10 billion over five years specifically for highway-related climate change mitigation and adaptation programs. More funding could be available for mitigation and adaptation activities if state and local governments choose to use a portion of other federal highway grants for this purpose, as S. 2302 would allow. Funding would be authorized from the Highway Trust Fund, which derives most of its revenue from a tax on motor vehicle fuels. The major climate change-related provisions proposed by S. 2302 include the following:

### Mitigation Provisions

- Establishes new formula and competitive grant programs to support planning and projects that reduce on-road mobile sources of $CO_2$ emissions. Eligible projects might include ridesharing programs, truck stop electrification, and incident management programs. Funding would average $600 million annually for the formula program and $100 million annually for the competitive program.

- Establishes a new competitive grant program to support construction and operation of alternative fueling infrastructure along designated alternative fuel corridors. Funding would average $200 million annually.

- Establishes a new competitive grant program to support projects that would reduce GHG and air pollutant emissions at ports by reducing truck idling. Funding would average $74 million annually.

- Establishes a federal interagency working group to develop a strategy to transition the vehicle fleets of federal agencies to hybrid-electric vehicles, plug-in electric drive vehicles, and alternative fueled vehicles.

- Establishes a new competitive grant program for highway congestion reduction projects that may indirectly reduce transportation emissions. Funding would average $40 million annually.

### Adaptation Provisions

- Establishes a new grant program to support adaptation projects. Funding would average $986 million annually, with $786 million distributed to the states by formula and $200 million distributed competitively. The program would also encourage the development of resilience improvement plans.

- Makes certain "protective features" designed to mitigate the risk of recurring damage from extreme weather events, flooding, or other natural disasters eligible expenses under the federal highway program. The federal government would pay up to 100% of the cost of projects such as raising roadway grades, stabilizing slopes, and adding bridge scour protection; for most other types of highway construction, the states must pay at least 10% or 20% of the cost.

- Adds adaptation strategies to the required contents of the National Freight Strategic Plan and state freight plans.

- Adds wildfire and sea level rise to the definition of natural disaster in the Emergency Relief program, and explicitly makes economically justifiable resilience features eligible for funding as part of repair and reconstruction projects.

- Defines "natural infrastructure" as infrastructure that uses, restores, or emulates natural ecological processes, and makes such projects specifically eligible for funding.

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