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## Surface Transportation and Climate Change: Provisions in the Infrastructure Investment and Jobs Act (P.L. 117-58)

Surface transportation is a major source of carbon dioxide in the atmosphere, one of the main greenhouse gases (GHGs) contributing to climate change. The effects of climate change, such as extreme heat and sea level rise, also pose a threat to highways, bridges, and public transportation infrastructure. Congress reauthorized the surface transportation programs as part of the Infrastructure Investment and Jobs Act (IIJA; P.L. 117-58). The IIJA included *mitigation* policies and programs aiming to reduce GHG emissions from surface transportation and *adaptation* policies and programs aiming to make the surface transportation system less vulnerable and more resilient to the impacts of actual or expected future climate change. As with previous authorization acts, the IIJA funded surface transportation programs from the Highway Trust Fund (HTF). The IIJA also provided funding with a multiyear advance appropriation from the Treasury general fund.

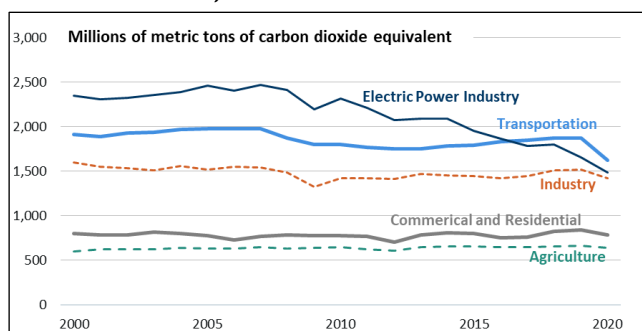
### Transportation and GHG Emissions

The U.S. Environmental Protection Agency (EPA) estimates that since 2017, transportation has emitted more GHGs than any other sector of the U.S. economy. In 2019, prior to the Coronavirus Disease 2019 (COVID-19) pandemic, transportation accounted for approximately 29% of the total (**Figure 1**). Total GHG emissions from transportation were about 5% less in 2019 than in 2005, but increased each year from a recent low in 2012 through 2018, in part because of increased passenger travel and goods movement; the effects of greater vehicle mileage have been somewhat mitigated by improvements in fuel efficiency. There was a slight reduction in transportation emissions in 2019, but a 14% drop in 2020 due largely to disruptions caused by the pandemic.

### Mitigating GHG Emissions from Surface Transportation

Economists generally agree that broad, market-based policies, such as a cap and trade system or carbon tax, are likely to be the most efficient way to reduce GHG emissions across all economic sectors. Motor vehicle fuel taxes might be considered a crude form of carbon tax in surface transportation, and the higher fuel taxes in other countries are associated with lower annual mileage per person and greater use of more fuel-efficient vehicles. In 2020, the average of U.S. state taxes weighted by fuel volume plus the federal tax on a gallon of gasoline was \$0.48. This compared with per-gallon taxes of \$2.59 in Japan, \$3.65 in the United Kingdom, and \$4.57 in Italy. Federal taxes on gasoline and diesel in the United States have been collected largely to raise funds for infrastructure construction, not to control GHG emissions. The IIJA extended through FY2028 the collection of the fuels and other taxes that accrue to the HTF.

**Figure 1. U.S. Greenhouse Gas Emissions by Economic Sector, 2000-2020**



Source: EPA, Draft Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2020, table 2-10.

Several other current federal policies that seek to reduce GHG emissions from transportation are not typically addressed in surface transportation reauthorization legislation, including the IIJA. This includes the regulation of vehicle fuel economy by the Corporate Average Fuel Economy standards administered by the National Highway Traffic Safety Administration and, by extension, the GHG standards, administered by EPA. These policies, along with tax incentives and grants for the domestic development and manufacture of alternative fueled vehicles, are typically dealt with in energy bills rather than in transportation legislation. Nevertheless, the IIJA contained energy provisions, including funding for a Clean School Bus Program administered by EPA. For more details, see CRS Report R47034, *Energy and Minerals Provisions in the Infrastructure Investment and Jobs Act (P.L. 117-58)*, coordinated by Brent D. Yacobucci.

Surface transportation programs reauthorized in the IIJA do in some respects encourage the deployment of alternative-fueled vehicles and a reduction of vehicle miles traveled. The Federal Transit Administration (FTA) Low and No Emission Vehicle program provides funding for alternatively fueled buses, and the Federal Highway Administration (FHWA) administers the Congestion Mitigation and Air Quality Improvement (CMAQ) program. The original motivation for these programs was to meet air quality goals, but such policies may help reduce GHGs from surface transportation.

### Adaptation to Climate Change in Surface Transportation

Impacts from actual or expected future climate change are 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. 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 more frequent periods of 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 become more pronounced, 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 could cause more damage to bridges because of greater thermal expansion of bridge joints.

“Adaptation” is action to reduce the vulnerabilities and increase the resilience of the transportation system to the effects of climate change. Adaptation and resilience options 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 reef construction, and beach restoration. Policy-based activities include changing maintenance practices, such as more frequent drain cleaning, and improving plans for weather emergencies.

Prior to the IIJA, FHWA had stated that federal highway funds could be used to assess the potential impacts of climate change and to apply adaptation strategies. Likewise, federal transit funding administered by FTA could be used for adaptation projects. Several aspects of federal law, regulation, and policy required state and local agencies that manage surface transportation assets to consider the effects of climate change.

## Infrastructure Investment and Jobs Act

The IIJA made several changes to law and surface transportation funding programs for mitigation and surface transportation infrastructure adaptation and resilience.

### Mitigation

The IIJA authorized and appropriated increases in funding for public transportation and intercity passenger rail. Some advocates of these provisions assert that this funding could mitigate climate change. This assumes that greater spending will boost rail and bus travel, replacing trips by private motor vehicles and airplanes—something that has been difficult to achieve in the past. Excluding COVID-19 relief and other emergency funding, public transportation program funding was \$13.0 billion annually in FY2021, whereas the amount authorized and appropriated in the IIJA was \$21.4 billion annually for FY2022-FY2026 (unadjusted for inflation). The Treasury general fund authorization for Amtrak and other intercity rail programs, subject to appropriation, increased from \$2.5 billion in FY2021 to an average of \$7.2 billion annually for FY2022-FY2026. In

addition, the IIJA appropriated \$13.2 billion annually for intercity rail programs for FY2022-FY2026.

The IIJA also authorized and appropriated an increase in funding for the federal highway program from \$47.3 billion in FY2021 to an annual average of \$73.1 billion for FY2022-FY2026. This may result in more highway vehicle travel and GHG emissions, but the funding included increases for new and existing highway programs aimed at emissions reductions. For example, funding from the HTF for the existing Transportation Alternatives Program increased from \$850 million in FY2021 to an annual average of \$1.4 billion for FY2022-FY2026. New mitigation programs and the average annual authorization in the IIJA from the HTF for FY2022-FY2026 were:

- Carbon Reduction Program: \$1.3 billion
- Charging & Refueling Grant Program: \$500 million
- Reduce Truck Emissions at Port Facilities: \$50 million
- Congestion Relief Program: \$50 million.

New programs and the average annual appropriation from the Treasury general fund for FY2022-FY2026 in the IIJA were:

- Electric Vehicle Charging Formula Program: \$1 billion
- Reduce Truck Emissions at Port Facilities: \$30 million.

### Adaptation and Resilience

The IIJA made several changes to the federal highway program aimed at improving adaptation and resilience. It added definitions of “resilience” and “natural infrastructure” to Title 23 of the *U.S. Code*. It specifically allowed federal funding to be used for “protective features” designed to mitigate the risk of recurring damage from extreme weather events, flooding, or other natural disasters. The IIJA also allowed states to use up to 15% of their annual apportionment of National Highway Performance Program funding for resilience features for highways or bridges that are not part of the National Highway System.

The IIJA also established the Promoting Resilient Operations for Transformative, Efficient, and Cost-saving Transportation (PROTECT) Program to support adaptation and resilience projects. Funding from the HTF was authorized at an annual average of \$1.7 billion.

The IIJA also authorized Treasury general funds for some new programs, subject to appropriations. This included \$100 million annually for Transportation Resilience and Adaptation Centers of Excellence, \$100 million annually for the Healthy Streets Program, and \$200 million annually for the Active Transportation Infrastructure Investment Program. Healthy Streets Program grants would be to construct pavement that reflects sunlight, to construct pavement porous to rainwater, and to expand tree cover.

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