
# Department of Transportation (DOT)

# MUNUC 34

# TABLE OF CONTENTS

**CHAIR LETTER**.....**3**

**HISTORY OF COMMITTEE**.....**5**

**TOPIC A: LEGALITY AND ETHICS OF GENETIC ENGINEERING**.....**6**

Statement of the Problem.....6

History of the Problem.....11

Past Actions..... 18

Possible Solutions.....21

Bloc Positions.....26

Glossary.....28

Bibliography.....29

**TOPIC B: INFORMATION PRIVACY AND PROTECTION**.....**33**

Statement of the Problem.....33

History of the Problem.....39

Past Actions..... 47

Possible Solutions.....52

Bloc Positions.....58

Glossary.....61

Bibliography.....62

# CHAIR LETTER

Dear Delegates,

Welcome to MUNUC 34! My name is Lily Hong, and I am so excited to be one of your co-chairs for the Department of Transportation. I am a third-year at the University of Chicago, double majoring in Anthropology and Law, Letters, and Society. Outside of MUNUC, I am the Vice President of Marketing for the Moot Court team and a member of the Service Committee for Women+ in Law.

Delegates in our committee this year will get the opportunity to consider two important topics in the US. As the US begins to consider its environmental impact, it must look inward at its domestic policies. Particularly, the US must figure out how to advance its transportation systems to be more environmentally conscious while still economically feasible. With the interest of the public combined with industry's economic interest, delegates must balance short-term and long-term concerns and benefits to allow for solutions that will achieve the goals of the Department of Transportation.

My co-chair and I are here as resources for you, so if you have any questions or concerns feel free to communicate those to us. We want to make sure you all see this as an opportunity to learn from one another and engage in productive debate to reach a resolution that addresses the many aspects of the topic you all choose. I look forward to meeting all of you in committee.

Sincerely,

Lily Hong

Dear Delegates,

Welcome to MUNUC 34! My name is Sherry Guo and I am delighted to be one of your co-chairs for the Department of Transportation. I am a third year at The University of Chicago majoring in Anthropology. Outside of MUNUC, I am a podcast editor and production assistant for podcaster Mike Schubert and I intern with the South Side Home Movie Project based at the University, where I assist with archival work for their film collection.

In this committee, delegates will engage in debate regarding one of two important topics relating to the environmental impact of transportation in the US. As the environmental damage of human activity becomes increasingly closer to a critical point, the US must make changes to its transportation systems to minimize damage to the environment while still being economically feasible. Delegates must consider how to satisfy both the wants of the public as well as those of industry leaders in the sector while working within the Department of Transportation's authority to achieve their administrative goals.

I, along with my co-chair, are here to be mentors for you, so please feel free to contact us regarding any questions or concerns you have. Our goal is to create a stimulating educational environment in which you can learn from your peers through lively and civil debate to address the topic you choose to explore throughout the conference. I look forward to working with you all in committee!

Sincerely,

Sherry Guo

# HISTORY OF THE COMMITTEE

The Department of Transportation was established in 1966 from the Department of Transportation Act.[1] In this Act, Congress authorized the Department to be "responsible for planning and coordinating federal transportation projects"—which includes projects like a high-speed rail system––and to set "safety regulations for all major modes of transportation"—which includes regulations like that of the aviation industry and their emissions.[2]

The Department of Transportation's official stated mission is "[t]o ensure America has the safest, most efficient and modern transportation system in the world, which boosts our economic productivity and global competitiveness and enhances the quality of life in communities both rural and urban."[3] The newly appointed Secretary of the Department, Pete Buttigieg, has further outlined three main priorities from this mission: safety, infrastructure, and innovation.[4] A high-speed rail fits into both the Department of Transportation's official mission and Secretary Buttigieg's three priorities as it constitutes a huge infrastructure project and innovates on the outdated train technologies that are predominantly used in the US.

[1] "Department of Transportation Act," (Public Law 89-670, 1966), 18. https://www.govinfo.gov/content/pkg/STATUTE-80/pdf/STATUTE-80-Pg931.pdf#page=18.
[2] "U.S. Department of Transportation," USAGov, accessed July 23, 2021, https://www.usa.gov/federal-agencies/u-s-department-of-transportation.
[3] "About DOT | US Department of Transportation," Transportation.gov, 2019, https://www.transportation.gov/about.
[4] "Priorities | US Department of Transportation," Transportation.gov, 2019, https://www.transportation.gov/priorities.

# TOPIC A: BUILDING A HIGH-SPEED RAIL

## Statement of the Problem

***Introduction to the Problem***

Beginning in 1965 with the High-Speed Ground Transportation Act, the United States has been attempting to build a national high-speed rail system for over 50 years.[5] The public and politicians alike have recognized the importance of a high-speed rail for the technological advancement of the country, for improved convenience and efficiency, and more recently, the positive environmental impact of public transportation. In a 2010 poll, 60 percent of Americans were in favor of a "major overhaul of the rail system."[6] However, despite the popular acknowledgement of these many benefits, the US has remained unsuccessful in their creation of a national high-speed rail for a variety of reasons.[7] In addition to the strong lobbying against high-speed rails from the auto and aviation industries, critics of the high-speed rail also have voiced many valid concerns about high costs and feasibility. Ultimately, however, the issue comes down to a lack of political will and consequently a lack of funding.[8]

What differentiates high-speed rails from regular passenger trains is evident in the name: high-speed rails are faster than regular trains. While there is no single official definition for what constitutes a high-speed rail, the International Union of Railways (UIC) established that its primary criterion for a high-speed rail is if it travels at a commercial speed of 250 kilometers per hour (approximately 155 miles per hour).[9] However, newer high-speed rail systems, like those in China, travel at speeds as

[5] "Homepage," WBFO, 2021, https://www.wbfo.org/.
[6] Michael J Ahn and Malcolm L Russell-Einhorn, "A Vision of High-Speed Rail in America: Time for a National Conversation?," Brookings (Brookings, June 29, 2015), https://www.brookings.edu/blog/techtank/2015/06/29/a-vision-of-high-speed-rail-in-america-time-for-a-national-conversation/.
[7] "High-Speed Rail Timeline | FRA," Dot.gov, 2019, https://railroads.dot.gov/passenger-rail/high-speed-rail/high-speed-rail-timeline.
[8] Michael J Ahn and Malcolm L Russell-Einhorn, "A Vision of High-Speed Rail in America: Time for a National Conversation?," Brookings (Brookings, June 29, 2015), https://www.brookings.edu/blog/techtank/2015/06/29/a-vision-of-high-speed-rail-in-america-time-for-a-national-conversation/.
[9] UIC Communications, "The Definition of High Speed Rail – UIC Communications," UIC Communications (UIC Communications, July 22, 2021), https://www.uic.org/com/enews/nr/596-high-speed/article/the-definition-of-high-speed-rail?page=thickbox_enews.

high as 350 kph (217 mph).[10] High-speed rails are built in two main ways: (1) upgrading existing, conventional train tracks for higher speeds or (2) building entirely new tracks for these higher speeds. Many proponents of high-speed rail support a combination of these two strategies with the building of new tracks that connect to existing rails to allow for the swift integration of high-speed rails.

***Benefits***

There are many benefits to the creation of a high-speed rail. One of the most appealing aspects is the economic benefit. As a large infrastructure project (whether that be the creation of an entirely new train track or an updating of existing tracks), the creation of a high-speed rail system would create many jobs. According to the American Public Transportation Association, building a high-speed rail would create hundreds of thousands of jobs, as 24,000 jobs are created per $1 billion investment.[11] In addition to the many thousands of jobs, a rail would also likely increase economic activity in the country. By allowing for easier travel between "America's economically vital mega-regions," a high-speed rail would allow for more efficiency and more business between cities.[12] Historically, these connections between urban hubs—whether that be by horse, boat, or train—have allowed for the advance of both the traditional and the information economy. Some economists even predict that high-speed rails will help with the housing markets of cities where there is overcrowding and increasing home prices by allowing for more decentralization; the routes would allow for more people to move out of cities and still be able to easily commute.[13]

Further, a high-speed rail would benefit the country in international relations, environmental protection, and equity. Through its superior energy efficiency as compared to airplanes and

[10] Ben Jones, "Past, Present and Future: The Evolution of China's Incredible High-Speed Rail Network," CNN (CNN, May 20, 2021), https://www.cnn.com/travel/article/china-high-speed-rail-cmd/index.html.
[11] APTAAdmin, "Benefits of High-Speed Rail for the United States - American Public Transportation Association," American Public Transportation Association, March 17, 2021, https://www.apta.com/research-technical-resources/high-speed-passenger-rail/benefits-of-high-speed-rail-for-the-united-states/.
[12] "Ibid."
[13] "Could High-Speed Rail Ease California's Housing Crisis? See Japan.," Bloomberg.com (Bloomberg, January 25, 2019), https://www.bloomberg.com/news/articles/2019-01-25/could-high-speed-rail-help-california-s-housing-crisis.

automobiles, a high-speed rail would allow for a decreased national dependence on foreign oil.[14] This increased energy efficiency is also environmentally beneficial. While a full flight can range from 1.5-2 megaJoule (MJ)/passenger-kilometer (pkm), with high passenger loads, some of the best rails, such as in Tokyo, require less than 0.1 MJ/pkm.[15] Automobiles can require 2 MJ/pkm.[16] While the US is not as densely populated as some of the countries with high-speed rails like France or Japan, increased efficiency is still possible for intercity routes, such as from New York to Boston.[17] Other potential environmental benefits of the high speed rail include a decrease in greenhouse gas emissions and improved air quality.[18] Many supporters of the high-speed rail also note that improvements to public transportation provide more affordability and accessibility for poorer people and/or those living in rural areas.

***Criticism***

While these many benefits easily demonstrate the United States' need for a high-speed rail, there remain many valid concerns and criticisms of the creation of this rail that must be considered in plans for the rail. Despite the large-scale job creation, the high cost of a high-speed rail would add to the country's national debt. Many critics note that the investment required of the government for this project is on the scale of billions of dollars, and as of June of 2021 the national debt is already over $28 trillion and climbing.[19] Further, highways in the US are doing extremely well and cost less. Rail critics note that government costs for highways are between 1-4 cents per driver, while government costs for Amtrak trains are 13 cents per rider.[20]

Critics also argue that a high-speed rail is actually not an instance of technological innovation. They argue it is outdated technology as it only serves to transport passengers (not cargo) and is both

[14] Elizabeth Deakin, "Environmental and Other Co-Benefits of Developing a High Speed Rail System in California: A Prospective Vision 2010-2050 Symposium Environmental Impact of High Speed Rail in California," 2010, https://gspp.berkeley.edu/assets/uploads/page/HSR10_Deakin.pdf.
[15] Vaclav Smil, "Fast Trains Are Energy Efficient (And Fast)," December 26, 2018, https://spectrum.ieee.org/transportation/mass-transit/fast-trains-are-energy-efficient-and-fast.
[16] "Ibid."
[17] "Ibid."
[18] "Ibid."
[19] "What Is the U.S. National Debt Right Now — and Why Is It so High?," Pgpf.org, 2021, https://www.pgpf.org/national-debt-clock.
[20] Natasha Frost, "A Decade Ago, the US Was Promised High-Speed Rail—so Where Is It?," Quartz, December 27, 2019, https://qz.com/1761495/this-is-why-the-us-still-doesnt-have-high-speed-trains/.

slower and currently more expensive than air travel in the US.[21] The Amtrak Acela, the only high-speed train currently operating in the US, costs about five times as much as airfares.[22] However, this current high cost is largely due to the lack of government funding for passenger rails and, ironically, the great success of the private US freight rails.[23] Currently in the US, the priority of trains is on freight companies instead of passengers, which complicates scheduling for passenger trains and raises the prices.

Even those who are generally interested in large, expensive transportation infrastructure projects are not necessarily in support of a high-speed rail system. While a high-speed rail would focus on inter-city routes, many are more in favor of intra-city projects. For example, in 2013 Amtrak emphasized the 11.4 million passengers who used their rails to travel between Washington DC and Boston.[24] However, that number is small compared to just the transit system in Miami, which transported more than 20 million passengers in 2015. Others also support any spending going towards highways, arguing that money will be better spent on improving existing infrastructure that is proven to be popular.[25] However, further investment in highways would not address the issues of environmental consideration or technological innovation.

Another cause for concern in the creation of high-speed rail relates to the actual land it uses. As to the environmental issue, many environmentalists also question how much impact on the environment the building of the rail will actually have. While the rail after being built will be better for air quality and decrease carbon emissions in the long run, the use of land for the rail can have an impact on the habitat, flora, fauna, etc.[26] In addition to environmental impacts, there are also worries about impacts on humans: for example, the loss of homes and businesses in areas needed for

[21] "The High-Speed Rail Money Sink: Why the United States Should Not Spend Trillions on Obsolete Technology," Cato Institute, April 20, 2021, https://www.cato.org/policy-analysis/high-speed-money-sink-why-united-states-should-not-spend-trillions-obsolete.
[22] "Ibid."
[23] Matthew Yglesias, "Amtrak Turns 45 Today. Here's Why American Passenger Trains Are so Bad.," Vox (Vox, May 2016), https://www.vox.com/2016/5/1/11539966/amtrak-45-anniversary.
[24] "Ibid."
[25] "The High-Speed Rail Money Sink: Why the United States Should Not Spend Trillions on Obsolete Technology," Cato Institute, April 20, 2021, https://www.cato.org/policy-analysis/high-speed-money-sink-why-united-states-should-not-spend-trillions-obsolete.
[26] Elizabeth Deakin, "Environmental and Other Co-Benefits of Developing a High Speed Rail System in California: A Prospective Vision 2010-2050 Symposium Environmental Impact of High Speed Rail in California," 2010, https://gspp.berkeley.edu/assets/uploads/page/HSR10_Deakin.pdf.

the rail. Historically, large transportation infrastructure projects, like the building of the freeways in the 1960s, have disproportionately impacted communities of people of color.[27] Plans must be considerate of these communities to ensure they are protected and can benefit from the creation of rails, too.

Ultimately, in creating the high-speed rail, delegates in this committee must consider not only the benefits, but also potential drawbacks. For example, while job creation is an obvious benefit, attempts to limit further contribution to the nation's already large debt should also be pursued. The benefits are overwhelming, but the criticisms remain important to note and include in the final plans.

[27] Marc Joffe, "The California High-Speed Rail Project's Negative Impacts on Minority Communities - Reason Foundation," Reason Foundation, May 17, 2021, https://reason.org/commentary/the-california-high-speed-rail-projects-negative-impacts-on-minority-communities/.

# History of the Problem

***Introduction***

Before attempting to draft the plan to create a new high-speed rail, it is important to understand the history of transportation in the US and the historical and ongoing barriers to the creation of the high-speed rail. In addition to knowing the history of US transportation generally, an understanding of the Department of Transportation itself will aid in a discussion on the complexities of the problem.

***History of Transportation***

***The Railroad***

As the United States began to expand the country further west in the 19th century, improving the transportation systems became extremely important. At first, settlers relied on rivers and roads, eventually using canals and railroads as well. In 1826, a horse-powered rail was constructed in Quincy, Massachusetts to haul granite.[28] That same year in Hoboken, New Jersey, John Stevens, often deemed the "father of American railroads," proved the viability of his steam locomotive on his circular experiment track.[29] A year later in 1827, the first railroad in the US to transport both passengers and freight was chartered: the Baltimore & Ohio.[30] From there, railroads in the US quickly began to gain steam.

Many other train lines joined the B&O Railroad including the Saratoga, the South Carolina Canal and Railroad Company, the Columbia Railroad of Pennsylvania, and more.[31] These early railroads were privately funded with indirect federal subsidies in the form of route surveys which were provided by US army engineers.[32] Steam railroads were first used in the US around the 1830s, quickly becoming

[28] "The Beginnings of American Railroads and Mapping," The Library of Congress, 2015, https://www.loc.gov/collections/railroad-maps-1828-to-1900/articles-and-essays/history-of-railroads-and-maps/the-beginnings-of-american-railroads-and-mapping/.
[29] "Ibid."
[30] Christopher Klein, "10 Trains That Changed the World," HISTORY (HISTORY, May 12, 2017), https://www.history.com/news/10-trains-that-changed-the-world.
[31] "The Beginnings of American Railroads and Mapping," The Library of Congress, 2015, https://www.loc.gov/collections/railroad-maps-1828-to-1900/articles-and-essays/history-of-railroads-and-maps/the-beginnings-of-american-railroads-and-mapping/.
[32] Ibid.

the dominant transportation system in the Continental US just two decades later in the 1850s.[33] The 1860s was the "golden age of railroads," with support from politicians and the public alike for a transcontinental railroad.[34] Congress passed the Railroad Act of 1862, creating the Union Pacific Railroad that connected with the Central Pacific Railroad in Utah.[35]

With the help of land grants, this expansion of railroads continued in the 1870s.[36] In the mid- to late-nineteenth century, the US government gave many cessions of public land to both states and private railroad companies to promote the construction of more railroads. These rails allowed more towns and cities that were not close to any waterways or coasts to prosper.[37] By the 1920s, railroads were essential to American life, carrying everything from people to manufactured goods to food to the daily mail.[38] In fact, at that time, around 75 to 80 percent of all intercity freight in the US were transported via rail.[39] In addition to providing goods and transportation to millions of Americans, rails also employed over 1.7 million employees in the 1920s.[40]

***The Rise of the Car***

However, while the US remained extremely reliant on trains in the early 1900s, there simultaneously was the beginning of the rise of cars and highways. By the late 1930s, Route 66 was completed, running from Chicago to Los Angeles and connecting hundreds of towns to allow for trucking throughout the Southwest. By the 1940s and 1950s after the end of World War II, the US became increasingly suburban and demand for cars was high. In addition to the rise in automobile travel, in

[33] "Transportation before 1876," National Museum of American History, February 28, 2017, https://americanhistory.si.edu/america-on-the-move/transportation-1876.
[34] "Chronology of America's Freight Railroads," Association of American Railroads, July 16, 2021, https://www.aar.org/chronology-of-americas-freight-railroads/.
[35] "The Transcontinental Railroad," The Library of Congress, 2015, https://www.loc.gov/collections/railroad-maps-1828-to-1900/articles-and-essays/history-of-railroads-and-maps/the-transcontinental-railroad/.
[36] "The Beginnings of American Railroads and Mapping," The Library of Congress, 2015, https://www.loc.gov/collections/railroad-maps-1828-to-1900/articles-and-essays/history-of-railroads-and-maps/the-beginnings-of-american-railroads-and-mapping/.
[37] "Ibid."
[38] "Ibid."
[39] "Ibid."
[40] "Ibid."

the late-1950s the passenger jet quickly grew in popularity and provided yet another option for travel that was not rail travel.[41]

During WWII, American automobile manufacturers redirected their factories to create military items, resulting in a shortage of cars and subsequent rationing of cars during the War.[42] This rationing meant that many people were still driving their barely-usable cars from before the Great Depression, and once WWII ended, there was a boom in car sales.[43] With the increased ownership and usage of automobiles post-WWII, the car shaped the layouts of these new suburbs, as these suburban towns were more decentralized than the urban cities.[44] The increasing number of suburbs also resulted in the building of highways to connect city and suburb and allow for suburban workers to be able to commute to the city. The car's influence on the suburbs was a mutualistic relationship, as the construction of more suburbs in turn supported the popularity of cars.

However, the building of these new highways disproportionately impacted communities of people of color and immigrants. Especially evident of this effect of highways is South Side Chicago where thousands of families lost their homes, neighborhoods, and livelihoods to the new highways.[45] The negative impacts of these highways did not end there, however. Even for the communities that the building of the highways did not tear down, the placement of the highways served as a segregator between inner-city black neighborhoods and ethnic white neighborhoods.

By the 1950s, American reliance on cars was cemented. In 1956, Congress passed the Federal-Aid Highway Act, one of the largest public works programs in history. This Act allowed for a 41,000-mile system that was meant to connect every city with a population of over 100,000.[46] It planned for the federal government to provide 90 percent of the funding with the state governments providing the other 10 percent. During this period, ridership on non-commuter rails declined 84 percent with the

[41] "High-Speed Rail in the United States: A Golden Opportunity," Global Railway Review, May 5, 2021, https://www.globalrailwayreview.com/article/122442/high-speed-rail-united-states-opportunity/.
[42] History.com Editors, "Automobile History," HISTORY (HISTORY, April 26, 2010), https://www.history.com/topics/inventions/automobiles#section_7.
[43] "Ibid."
[44] "Ibid."
[45] "Ibid."
[46] "Ibid."

increased accessibility to cars.[47] Ridership declined further once the highways were mostly built, and many train lines began to shut down.[48]

While Americans had become increasingly reliant on the automobile for transportation, by the 1960s and 1970s environmental and economic concerns were also growing. In the 60s, concerns over air pollution blamed cars and the auto-industry, with pushes for better regulations. About a decade earlier, the US began importing a lot of oil from other countries to keep up with the demand. However, in the 1970s, as a result of American policy in the Middle East—from which most of American oil was imported—there was an embargo on oil going into the US.[49] This shortage threatened US automobility and worsened concerns on reliance for foreign oil.

In 1970, during this period of car concern, then-President Richard Nixon signed the Rail Passenger Service Act which created the National Railroad Passenger Corporation, also known as Amtrak.[50] Amtrak was created to take over the intercity passenger rail obligations that belonged to private railroads as a result of the declining ridership, starting in the mid-1940s and continuing to fall into the 1970s.[51] Admission to Amtrak only involved payment of approximately half of the rail's 1970 losses on passenger services.[52] Once a rail was admitted to Amtrak, they experienced the large benefit of being free from paying for all future passenger-related losses.[53] In just a year after its creation, 20 railroads opted-in to Amtrak. However, even with the creation of the state sponsored railroad company, cars and the auto-industry remained the primary transporters of Americans. Not only did 87.2 percent of American households own at least one motor vehicle, but in 1982 one in six jobs in the US were provided by the auto-industry.[54]

---

[47] "Modern Decline of Railroads," HowStuffWorks, April 18, 2008, https://history.howstuffworks.com/american-history/decline-of-railroads.htm.
[48] "Ibid."
[49] "Interstate 10," National Museum of American History, February 28, 2017, https://americanhistory.si.edu/america-on-the-move/interstate-10.
[50] "Historic Timeline — Amtrak: History of America's Railroad," Amtrak.com, 2020, https://history.amtrak.com/amtraks-history/historic-timeline.
[51] "Modern Decline of Railroads," HowStuffWorks, April 18, 2008, https://history.howstuffworks.com/american-history/decline-of-railroads.htm.
[52] "Ibid."
[53] "Ibid."
[54] History.com Editors, "Automobile History," HISTORY (HISTORY, April 26, 2010), https://www.history.com/topics/inventions/automobiles#section_7.

Today the use of the car remains supreme over the train in the US. The US is one of the world's largest automobile markets with more than 17 million vehicle registrations in just 2019.[55] The US meets this demand through imports, primarily from countries like Japan, Mexico, and Canada.[56]

***Department of Transportation's Role***

In 1966, around the same time that the US first began its support for a high-speed rail, the Department of Transportation Act was passed to create the Department of Transportation.[57] While the Department of Transportation does not have the authority to legislate a high-speed rail into existence, Congress did authorize the Department to be "responsible for planning and coordinating federal transportation projects," including projects like a high-speed rail system which fits into both the Department of Transportation's official mission and Secretary Buttigieg's three priorities as it constitutes a huge infrastructure project and innovates on the outdated train technologies that are predominantly used in the US.[58]

Administrations under the Department, especially the Federal Railroad Association (FRA), have been integral in past efforts to bring about a high-speed rail in the US. When President Johnson passed the High Speed Ground Transportation Act of 1965, for example, the FRA was in charge of actually applying the funding. Further, in the early 1980s, the FRA helped develop a series of reports on "Emerging Corridors" in the US that could potentially use a high-speed rail.[59] In 1990, when Congress began considering Maglev technology for a potential rail, it requested the FRA to test the actual feasibility of the new technology.[60] Maglev stands for magnetic levitation. Maglev train technologies use magnets to suspend and guide the train in the air.[61]

---

[55] "Number of Cars in U.S. | Statista," Statista (Statista, 2019), https://www.statista.com/statistics/183505/number-of-vehicles-in-the-united-states-since-1990/.

[56] "Ibid."

[57] "Department of Transportation Act," (Public Law 89-670, 1966), 18. https://www.govinfo.gov/content/pkg/STATUTE-80/pdf/STATUTE-80-Pg931.pdf#page=18

[58] "U.S. Department of Transportation," USAGov, accessed July 23, 2021, https://www.usa.gov/federal-agencies/u-s-department-of-transportation.

[59] "High-Speed Rail Timeline | FRA," Dot.gov, 2019, https://railroads.dot.gov/passenger-rail/high-speed-rail/high-speed-rail-timeline.

[60] "Ibid."

[61] David Peterman, "The Development of High Speed Rail in the United States: Issues and Recent Events" (2013), 15, https://fas.org/sgp/crs/misc/R42584.pdf.

### *Attempts at a High-Speed Rail*

American support for a high-speed rail has existed for over five decades, with hopes to build a rail existing since 1964 when Japan first built their Shinkansen line.[62] However, despite this interest and many actual attempts, there still is no rail. In 1965, President Lyndon B. Johnson signed the High-Speed Ground Transportation Act, which authorized $90 million for the first US high-speed rails in the Northeast, connecting Washington D.C. and Boston.[63] The Federal Railroad Administration used this funding to begin applying (then-)modern technologies like self-propelled Metroline cars and the Turbotrain in the Northeast alongside long term planning for further high-speed technologies. However, after two decades in 1975, funds from the Act ran out without a high-speed rail in place. This lack of funds, even after legislation has been passed, is a common theme in the history of an American high-speed rail that will be further discussed in the Past Actions section.

### *Lobbying and Activism*

As established in the introduction of the Statement of the Problem and in the section immediately above, ultimately the largest barrier to a high-speed rail is a lack of political will and the consequent lack of funding. This lack of political will comes from intense lobbying against public transportation projects, like that of a high-speed rail, with millions of dollars of funding from conservatives like the Koch brothers.[64] Koch-financed activists, under the group Americans for Prosperity, target specific cities and countries such as Little Rock, Arkansas; Phoenix, Arizona; southeast Michigan; central Utah; and Tennessee.[65]

Utilizing many of the criticisms stated in the Criticism section of the Statement of the Problem, these activists attack almost all attempts at public transportation projects by citing the high cost, claiming it is outdated, and also noting the possibility of gentrification and underrepresentation to unite people across the political spectrum against these rails. While these concerns are in many ways

[62] "High-Speed Rail Timeline | FRA," Dot.gov, 2019, https://railroads.dot.gov/passenger-rail/high-speed-rail/high-speed-rail-timeline.
[63] "The U.S. Has Tried to Build High-Speed Rail for 50 Years - Marketplace," Marketplace, April 5, 2019, https://www.marketplace.org/2019/04/04/us-has-tried-build-high-speed-rail-50-years/.
[64] "How the Koch Brothers Are Killing Public Transit Projects around the Country (Published 2018)," *The New York Times*, 2021, https://www.nytimes.com/2018/06/19/climate/koch-brothers-public-transit.html.
[65] "Ibid."

valid, the Koch brothers are motivated by their pro free-market philosophy and their own financial ties to the auto-industry.[66] Groups like Americans for Prosperity and lobbyists working for people like the Koch brothers have had a tremendous impact in preventing the creation of a high-speed rail, and must be considered in the drafting of the ultimate plan.

[66] "Ibid."

# Past Actions

***Introduction***

As has been established in earlier sections, the desire for a high-speed rail in the United States has existed for quite some time, first appearing politically in the 1960s. The first attempt was with the High Speed Ground Transportation Act of 1965, whose failure we discussed in the History of the Problem Section. Already in 1965, with the passage of the Act, President Lyndon B. Johnson noted how outdated train technologies were in the US, lamenting "We have airplanes which fly three times faster than sound. We have television cameras that are orbiting Mars. But we have the same tired and inadequate mass transportation between our towns and cities that we had 30 years ago."[67]

Yet despite this early recognition of the benefits of high-speed rail, less than a decade later in the 1970s, the US shifted away from its direct efforts to create it. Eventually in the 1980s, the government returned to conscious attempts to bring about high-speed rail, and these efforts have continued in various forms to the present. However despite these many attempts over the past six decades, the US obviously still lacks a high-speed rail today. This section will include some of the key attempts in the past to achieve a high-speed rail and why they failed in doing so.

***The Federal Railroad Administration in the 1980s and Early 1990s***

While the 1970s featured the end of the High Speed Ground Transportation Act of 1965, the country's first attempt at high-speed rail, and a shift away from hopes of building a new high-speed rail, by the 1980s the FRA and Amtrak were back on track with research and plans for a high-speed rail system. Between 1980 and 1981, the FRA developed a series of reports on "Emerging Corridors" in the US.[68] These reports detailed potential areas in the US where high-speed rail could be built. Also in 1980, Congress passed the Passenger Railroad Rebuilding Act, which by 1984 set aside $4 million for research of high-speed ground transportation studies at the state level.[69] Throughout the

[67] "Remarks at the Signing of the High-Speed Ground Transportation Act," Ucsb.edu, 2021, https://www.presidency.ucsb.edu/documents/remarks-the-signing-the-high-speed-ground-transportation-act.
[68] "High-Speed Rail Timeline | FRA," Dot.gov, 2019, https://railroads.dot.gov/passenger-rail/high-speed-rail/high-speed-rail-timeline.
[69] "Ibid."

end of the 1980s and to the mid 1990s, more funding was used to continue research of high-speed rails and maglev technology. In 1992, the FRA designated five high-speed rail corridors and legislation continued to include high-speed rail language. However, due to the lack of significant funding and the lack of support to provide any direction to the proposed projects, no high-speed rails were actually created.

***Clinton Administration***

In 1993, the Clinton administration announced a plan to develop federal-state partnerships to build a high-speed rail network between cities across the nation. The plan was expected to occur over the course of the next five years and cost $1.3 billion.[70] $982 million of the total was to be split between the state and local governments for high-speed rail projects.[71] $300 million was designated for the development of a maglev train prototype, and another $25 million would be used for research on rail-related scientific advances. His plan involved a tax increase on households making more than $200,000 per year.[72] Once President Clinton announced the plan, the first step was for the DOT to establish potential routes and begin developing master plans alongside state and local officials.[73] However, the $1.3 billion budget merely led to the opening of the Acela Express, the United States' only high-speed rail, in 2000, and was far from enough for a national high speed rail.[74]

***Obama Administration***

Most recently, when President Barack Obama came into office in 2009, he had big plans for infrastructure projects in the American Recovery and Reinvestment Act (ARRA) which included a high-speed rail. However, ultimately he was only able to secure $8 billion for rail projects, and Republican governors in Florida, Ohio, and Wisconsin dismissed any funding offers as they

[70] "Administration Unveils $1.3 Billion High-Speed Rail Proposal (Published 1993)," *The New York Times*, 2021, https://www.nytimes.com/1993/04/29/us/administration-unveils-1.3-bilion-high-speed-rail-proposal.html.
[71] "Ibid."
[72] "Changing Direction: Clinton Advocates High Speed Rail," AP News (November 25, 1992), https://apnews.com/article/9195363bf64907be3e465ofdbb05a1ba.
[73] "Ibid."
[74] Gabby Birenbaum, "Beyond Stimulus: Gen Z's Dream of High-Speed Rail and Green New Deal Infrastructure," Vox (Vox, March 10, 2021), https://www.vox.com/2021/3/10/22303355/gen-z-high-speed-rail-biden-map-meme-buttigieg.

disapproved of the high-speed rail for which it was earmarked.[75] While $810 million had been set aside for a high-speed rail between Madison and Milwaukee, Wisconsin Governor Scott Walker rejected it when he was unable to redistribute it for a different transportation project.[76] Then, Ohio Governor John Kasich, following one of his campaign promises against the rail, also turned down the $385 million from the federal government that was earmarked for the rail. Unfortunately, that rejection only came after $15 million had already been spent on initial engineering efforts that were no longer needed.[77] The rejection of these two grants, which alone equaled over $1 billion, were going to be primarily spent in Florida for a high-speed rail there. However, Florida's Governor Rick Scott also rejected the $2 billion grant offered.

Ultimately, the money from the ARRA went to general improvements of the US rails instead of a high speed rail. Similar to previous attempts, a lack of political will and a lack of funding effectively killed the high-speed rail project. However, other experts have also said that even if these governors did not reject the funding, Obama's high-speed rail was doomed from the start of its funding, as "at least $20 billion" would have been needed to build high-speed rail, yet he had only been given $8 billion by Congress.[78] According to Joe Szabo, the head of the FRA from 2009 to 2015 during the Obama administration, "For high-speed rail to succeed, it can't be done with fits and starts [...] Major projects take years to build out, so there has to be predictability."[79]

***Conclusion***

It is important to use failures from the past to learn for the future. These past failed efforts demonstrate that any large infrastructure plan, like a high-speed rail, will inevitably take time, so the funding needs to be planned ahead to protect against the changing political priorities that will occur over the years. Thus, sources of reliable funding must be addressed from the beginning in any resolution.

---

[75] "Ibid."
[76] Natasha Frost, "This Is Why the US Still Doesn't Have High-Speed Trains," Quartz (Quartz, December 27, 2019), https://qz.com/1761495/this-is-why-the-us-still-doesnt-have-high-speed-trains/.
[77] "Ibid."
[78] "Ibid."
[79] "Ibid."

# Possible Solutions

### *Introduction*

The two strategies for the creation of a high-speed rail involve either upgrades to existing tracks or the building of entirely new routes. The main solutions that proponents for the high-speed rail have developed involve various combinations of these two strategies. This section will focus on the main strategies that have been discussed for implementing high-speed rail in the US.

### *New Routes and New Technology*

One promising 'new' (it was introduced in the 1980s) technology that many have supported for use in a new high-speed rail is maglev. While some of the world's fastest electric trains are maglev trains, most countries with high-speed rail systems today do not utilize maglev technologies.[80] The main reason is the extremely high cost. This high cost is mostly due to the fact that maglevs must be built from scratch and cannot use the pre-existing tracks, as they involve an entirely different technology. This solution would definitively advance US train technologies; however, the high cost of entirely new train infrastructure is a difficult selling point, even for some proponents of high-speed rail in the US.

### *The Integrated Network Approach*

The integrated network approach, one of the most popular solutions for high-speed rail, involves the creation of a high-speed rail by working with the tracks already in place. This strategy is one that is used by most countries with high-speed rails.[81] This approach allows for the current train routes to continue running even as high-speed rails are being built. The new high-speed lines are added steadily over time, and allow passengers to easily switch between both conventional and high-speed

[80] Dave Hall, "Maglev Trains: Why Aren't We Gliding Home on Hovering Carriages?," the Guardian (The Guardian, May 29, 2018), https://www.theguardian.com/technology/2018/may/29/maglev-magnetic-levitation-domestic-travel.

[81] "Integrated Network Approach in a Nutshell," High Speed Rail Alliance, April 7, 2020, https://hsrail.org/integrated-network-approach-nutshell.

trains to get to their destination.[82] The high speed lines are usually separated from the traditional railroads, roads, and walkways with bridges or tunnels to create protected corridors.[83] While this approach greatly lessens the likelihood of the use of maglev and similar energy efficient rail technologies in the future and does not advance the DOT goal of global competitiveness as much, ultimately it is more time efficient than the building of entirely new routes for maglev. This approach also allows for the upgrading of existing tracks over time to lead to overall improvements of train transportation in the US without as invasive an approach as maglev rails.

***Funding Sources and Costs***

The main costs of high-speed rail are found in two different categories; infrastructure and operating costs.[84] Infrastructure costs include the costs of the initial building of the rail and also the maintenance of the rail after it has been built; operating costs include costs of labor and fuel, which will vary depending on the amount of train service actually offered.[85] One important consideration is that even though there are many high-speed rails around the world, only two of them are actually considered to have earned enough revenue to fully cover both the infrastructure and operating costs.[86] And while profit in itself is not most high-speed rail supporters' main goal, the lower the costs the more likely advocates can find public and, importantly, political support.

Now that the costs have been established, the sources of funding for these extensive costs should be considered. As of 2015, the United States spent significantly less on rail infrastructure than other countries who have high-speed rails (see bar chart below). Many rail supporters agree that if a high-speed rail is to come to fruition in the US, the government needs to increase this spending. But what will be the source of this funding? This is a difficult and often an unanswered question. In 2009, the House Transportation and Infrastructure Committee actually submitted a proposal which included

[82] "Ibid."
[83] "Ibid."
[84] "Ibid."
[85] "Ibid."
[86] "Ibid."

$50 billion for high-speed rail development; however, they too were stumped by the question of funding and did not include any dedicated revenue source.[87]

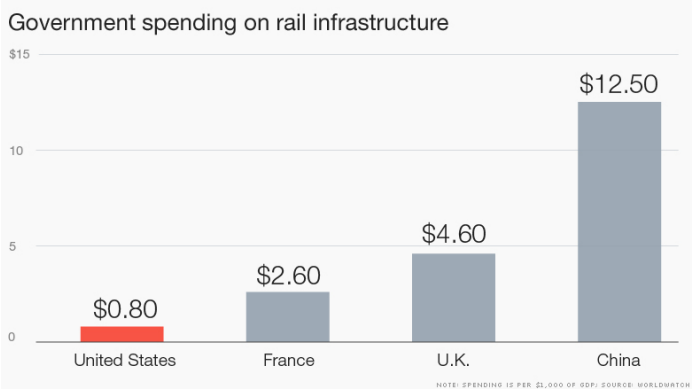


Chart detailing the differing amounts the US, France, UK, and China spend on their respective rails in 2015.[88]

This failure to adequately answer the question of from where the money will be sourced is something that has stopped many US high-speed rail efforts in their tracks. Various options for funding have been proposed: using money from the highway trust fund's revenues, adding a tax on tickets of rail passengers (similar to what airports do), using money from greenhouse gas emissions reduction programs, using bonds, or looking to the private sector to get funding. However, all of these options have their own downsides which must be considered. Importantly, funding solutions can involve a combination of funding sources. In addition to determining funding sources at the start of the plan, delegates should also be preemptive in considering how state and local efforts, like that of Koch brothers, can derail projects. That said, this is also a reminder that MUNUC is a learning conference, and we do not want delegates to get bogged down with the quantitative aspect of funding. Therefore, resolutions in this committee should include points on funding, but funding should not be the focus of the resolution. Proposals should attempt to address how to prevent state

[87] David Peterman, "The Development of High Speed Rail in the United States: Issues and Recent Events" (2013), 24, https://fas.org/sgp/crs/misc/R42584.pdf.
[88] Steve Hargreaves, "Why Doesn't the U.S. Have Better Trains?," CNNMoney, May 13, 2015, https://money.cnn.com/2015/05/13/news/economy/trains-money/index.html.

and local-level setbacks that delay the actual creation of the high-speed rail and as a result also increase the costs.[89]

***Local Initiatives***

As you will see in the next section, conservative lobbying groups have strategically used grassroots efforts to slow and prevent the building of high-speed rails in the past. Therefore, to help create and/or support political will to create and successfully *complete* a high-speed rail, local and community interests must be considered. For example, with the plans for the California High Speed Rail (HSR), criticism has come from various communities due to the plans' impact on each of their communities. The city of Tehachapi, California, for example, has presented many complaints, including noise pollution, that will affect their citizens.[90] The city of Tehachapi put out a public statement saying that "[d]espite eight years of working together with the HSR, the authority has failed to address the critical issues directed to them one year ago during the public review period."[91] Success in building a high-speed rail will require public support, which starts at the local level. Thus, listening and including public comment and review for plans is one good way to help local communities be heard.

Similar to the integrated network approach, utilizing the local infrastructure that exists is one important way that local communities can be easily included in the high-speed rail. By connecting the high-speed rail to existing local infrastructure such as local transit (particularly buses), airports, and highways, the high-speed rail will be built into the existing communities, ensuring the likelihood of their use. In a survey taken by 24,711 adults in December of 2010, 85 percent said that "the rail service should integrate with local public transit so they could avoid using rental cars and cabs, and paying parking fees."[92] The benefits of including local community voices and infrastructure are

[89] "High-Speed Rail in the United States: A Golden Opportunity," Global Railway Review, May 5, 2021, https://www.globalrailwayreview.com/article/122442/high-speed-rail-united-states-opportunity/.
[90] Anthony Wright, "Tehachapi identifies problems with the California high-speed rail project," 23 ABC, March 31, 2021, https://www.turnto23.com/news/local-news/tehachapi-identifies-problems-with-the-california-high-speed-rail-project.
[91] "Ibid."
[92] "An Inventory of the Criticisms of High-Speed Rail," American Public Transportation Association, January 2021, https://www.apta.com/wp-content/uploads/Resources/resources/reportsandpublications/Documents/HSR-Defense.pdf.

manifold; moreover, the consequences of ignoring local communities could prove to be fatal to any high-speed rail project. Thus, delegates should be sure to consider local initiatives in all resolutions.

# Bloc Positions

***Readily Supporting the Rail***

Most Department of Transportation administrators will readily support most rail options. Considering the overarching DOT goals of safe, modern, and efficient transportation which "boosts our economic productivity and global competitiveness and enhances the quality of life in communities both rural and urban," DOT administrators under the Biden Administration and under Secretary Buttigieg will generally be very approving of most high-speed rail choices as most options further these goals.[93] Alongside the DOT administrators, lobbyists like the ones from High Speed Rail Association and from American Public Transportation Association will be generally supportive of any rail options. However, unlike the DOT administrators who are more open to varying options, these lobbyists will likely not be welcome to some of the more constrained plans, such as those that may come from the aviation industry and conservative think tank lobbyists which downsize the high-speed rail plan, not for the sake of the success of the high-speed rail but for the sake of other interests including state rights, industry connections, or other economic reasons.

***Limiting the Rail***

Ultimately, the goal of this committee *is* to build a high-speed rail. So while lobbyists from conservative groups like the Koch Institute or aviation industry leaders normally would flat out oppose any high-speed rail plans, in this committee where a rail must be built, they will be reflecting their economic concerns for a rail. This 'opposition' will mean making sure plans consider the potential high cost of large-scale infrastructure projects like the high-speed rail, how plans might impact the auto and aviation industries, and preservation of their libertarian views, such as how to preserve states' rights and limitations to potentially overreaching federal plans. These concerns for the high speed rail will most likely attempt to downsize the projects as much as is possible and reasonable.

[93] "About DOT | US Department of Transportation," Transportation.gov, 2019, https://www.transportation.gov/about.

***Environmental Interest and Concerns***

While full support and limited support for a high-speed rail define many of the delegates in this committee, there are also some more specialized interests in the high-speed rail. Unlike the lobbyists and industry leaders who for the most part support the rail for a multitude of reasons, lobbyists from groups such as the Sierra Club or Earthjustice support it primarily for the benefits it can have for the environment. This means that, for these lobbyists, there must be a large focus on the environmental impacts of the building of the rail, as well as on ensuring that the high-speed rail, once it is finished and up and running, is as energy efficient and environmentally beneficial as possible.

# Glossary

**Maglev**: A term short for "magnetic levitation."[94] It involves the use of electromagnetic attraction and repulsion to allow for a vehicle to float while on land, allowing for smoother rides as a result of less friction.[95] Maglev trains are also often considered to be safer than traditional trains because any trains that are travelling on the same route can never crash into each other, as they are all powered to move at the same speeds.[96]

**Metroliner**: A type of high-speed rail that was first deployed in the US by the FRA in the late 1960s and was eventually phased out in the early 2000s.[97] They are self-propelled, using electric motors on each axle.[98]

**Turbotrain**: A type of high-speed rail that is powered by a gas-turbine engine. It was first introduced to the US in the late 1960s and quickly retired less than a decade later in 1976.[99]

[94] "Maglev," in *Encyclopædia Britannica*, 2021, https://www.britannica.com/technology/maglev-train.
[95] "How Maglev Works," Energy.gov, 2016, https://www.energy.gov/articles/how-maglev-works.
[96] "Ibid."
[97] "High-Speed Rail Timeline | FRA," Dot.gov, 2019, https://railroads.dot.gov/passenger-rail/high-speed-rail/high-speed-rail-timeline.
[98] "Extensive Overhauls Due for Metroliner Cars," Washington Post (The Washington Post, November 7, 1977), https://www.washingtonpost.com/archive/local/1977/11/07/extensive-overhauls-due-for-metroliner-cars/4d21b425-c566-43ef-bf0c-d651dd42797a/.
[99] "TurboTrain in Amtrak Livery, 1970s," Amtrak.com, 2011, https://history.amtrak.com/archives/ua-turbo-in-amtrak-paint.

# Bibliography

"About DOT | US Department of Transportation." Transportation.gov, 2019. https://www.transportation.gov/about.

"Administration Unveils $1.3 Billion High-Speed Rail Proposal (Published 1993)." The New York Times, 2021. https://www.nytimes.com/1993/04/29/us/administration-unveils-1.3-bilion-high-speed-rail-proposal.html.

Ahn, Michael J, and Malcolm L Russell-Einhorn. "A Vision of High-Speed Rail in America: Time for a National Conversation?" Brookings. Brookings, June 29, 2015. https://www.brookings.edu/blog/techtank/2015/06/29/a-vision-of-high-speed-rail-in-america-time-for-a-national-conversation/.

"An Inventory of the Criticisms of High-Speed Rail," American Public Transportation Association, January 2021, https://www.apta.com/wp-content/uploads/Resources/resources/reportsandpublications/Documents/HSR-Defense.pdf.

Anthony Wright. "Tehachapi identifies problems with the California high-speed rail project." 23 ABC, March 31, 2021. https://www.turnto23.com/news/local-news/tehachapi-identifies-problems-with-the-california-high-speed-rail-project.

APTAAdmin. "Benefits of High-Speed Rail for the United States - American Public Transportation Association." American Public Transportation Association, March 17, 2021. https://www.apta.com/research-technical-resources/high-speed-passenger-rail/benefits-of-high-speed-rail-for-the-united-states/.
"Changing Direction: Clinton Advocates High Speed Rail." AP News. November 25, 1992. https://apnews.com/article/9195363bf64907be3e4650fdbb05a1ba.

"Chronology of America's Freight Railroads - Association of American Railroads." Association of American Railroads, July 16, 2021. https://www.aar.org/chronology-of-americas-freight-railroads/.

"Could High-Speed Rail Ease California's Housing Crisis? See Japan.," Bloomberg.com (Bloomberg, January 25, 2019), https://www.bloomberg.com/news/articles/2019-01-25/could-high-speed-rail-help-california-s-housing-crisis.

Deakin, Elizabeth. "Environmental and Other Co-Benefits of Developing a High Speed Rail System in California: A Prospective Vision 2010-2050 Symposium Environmental Impact of Hall, Dave.

"Extensive Overhauls Due for Metroliner Cars." Washington Post. The Washington Post, November 7, 1977. https://www.washingtonpost.com/archive/local/1977/11/07/extensive-overhauls-due-for-metroliner-cars/4d21b425-c566-43ef-bfoc-d651dd42797a/.

Hargreaves, Steve. "Why Doesn't the U.S. Have Better Trains?" CNNMoney, May 13, 2015.

https://money.cnn.com/2015/05/13/news/economy/trains-money/index.html.

High Speed Rail in California," 2010.
https://gspp.berkeley.edu/assets/uploads/page/HSR10_Deakin.pdf.

"High-Speed Rail in the United States: A Golden Opportunity." Global Railway Review, May 5, 2021. https://www.globalrailwayreview.com/article/122442/high-speed-rail-united-states-opportunity/.

Frost, Natasha. "This Is Why the US Still Doesn't Have High-Speed Trains." Quartz. Quartz, December 27, 2019. https://qz.com/1761495/this-is-why-the-us-still-doesnt-have-high-speed-trains/.

Gabby Birenbaum. "Beyond Stimulus: Gen Z's Dream of High-Speed Rail and Green New Deal Infrastructure." Vox. Vox, March 10, 2021. https://www.vox.com/2021/3/10/22303355/gen-z-high-speed-rail-biden-map-meme-buttigieg.

"High-Speed Rail in the United States: A Golden Opportunity." Global Railway Review, May 5, 2021. https://www.globalrailwayreview.com/article/122442/high-speed-rail-united-states-opportunity/.

"High-Speed Rail Timeline | FRA." Dot.gov, 2019.
https://railroads.dot.gov/passenger-rail/high-speed-rail/high-speed-rail-timeline.

"Historic Timeline — Amtrak: History of America's Railroad." Amtrak.com, 2020.
https://history.amtrak.com/amtraks-history/historic-timeline.

History.com Editors. "Automobile History." HISTORY. HISTORY, April 26, 2010.
https://www.history.com/topics/inventions/automobiles#section_7.

"Homepage." WBFO, 2021. https://www.wbfo.org/.

"How Maglev Works." Energy.gov, 2016. https://www.energy.gov/articles/how-maglev-works.

"How the Koch Brothers Are Killing Public Transit Projects around the Country (Published 2018)." The New York Times, 2021. https://www.nytimes.com/2018/06/19/climate/koch-brothers-public-transit.html.

"Integrated Network Approach in a Nutshell." High Speed Rail Alliance, April 7, 2020.
https://hsrail.org/integrated-network-approach-nutshell.

"Interstate 10." National Museum of American History, February 28, 2017.
https://americanhistory.si.edu/america-on-the-move/interstate-10.

Joffe, Marc. "The California High-Speed Rail Project's Negative Impacts on Minority Communities." Reason Foundation, May 17, 2021. https://reason.org/commentary/the-california-high-speed-rail-projects-negative-impacts-on-minority-communities/.

Jones, Ben. "Past, Present and Future: The Evolution of China's Incredible High-Speed Rail Network." CNN. CNN, May 20, 2021. https://www.cnn.com/travel/article/china-high-speed-rail-cmd/index.html.

Klein, Christopher. "10 Trains That Changed the World." HISTORY. HISTORY, May 12, 2017. https://www.history.com/news/10-trains-that-changed-the-world.

"Maglev." In Encyclopædia Britannica, 2021. https://www.britannica.com/technology/maglev-train.

"Maglev Trains: Why Aren't We Gliding Home on Hovering Carriages?" The Guardian. The Guardian, May 29, 2018. https://www.theguardian.com/technology/2018/may/29/maglev-magnetic-levitation-domestic-travel.

"Modern Decline of Railroads." HowStuffWorks, April 18, 2008. https://history.howstuffworks.com/american-history/decline-of-railroads.htm.

"Number of Cars in U.S. | Statista." Statista. Statista, 2019. https://www.statista.com/statistics/183505/number-of-vehicles-in-the-united-states-since-1990/.

"Priorities | US Department of Transportation." Transportation.gov, 2019. https://www.transportation.gov/priorities.

Peterman, David. "The Development of High Speed Rail in the United States: Issues and Recent Events." 2013. 15. https://fas.org/sgp/crs/misc/R42584.pdf.

"Remarks at the Signing of the High-Speed Ground Transportation Act." Ucsb.edu, 2021. https://www.presidency.ucsb.edu/documents/remarks-the-signing-the-high-speed-ground-transportation-act.

"The Beginnings of American Railroads and Mapping." The Library of Congress, 2015. https://www.loc.gov/collections/railroad-maps-1828-to-1900/articles-and-essays/history-of-railroads-and-maps/the-beginnings-of-american-railroads-and-mapping/.

"The High-Speed Rail Money Sink: Why the United States Should Not Spend Trillions on Obsolete Technology." Cato Institute, April 20, 2021. https://www.cato.org/policy-analysis/high-speed-money-sink-why-united-states-should-not-spend-trillions-obsolete.

"The Transcontinental Railroad." The Library of Congress, 2015. https://www.loc.gov/collections/railroad-maps-1828-to-1900/articles-and-essays/history-of-railroads-and-maps/the-transcontinental-railroad/.

"The U.S. Has Tried to Build High-Speed Rail for 50 Years - Marketplace." Marketplace, April 5, 2019. https://www.marketplace.org/2019/04/04/us-has-tried-build-high-speed-rail-50-years/.

"Transportation before 1876." National Museum of American History, February 28, 2017. https://americanhistory.si.edu/america-on-the-move/transportation-1876.

"TurboTrain in Amtrak Livery." Amtrak.com, 2011. https://history.amtrak.com/archives/ua-turbo-in-amtrak-paint.

"U.S. Department of Transportation." USAGov. Accessed July 23, 2021. https://www.usa.gov/federal-agencies/u-s-department-of-transportation.

UIC Communications. "The Definition of High Speed Rail – UIC Communications." UIC Communications. UIC Communications, July 22, 2021. https://www.uic.org/com/enews/nr/596-high-speed/article/the-definition-of-high-speed-rail?page=thickbox_enews.

Vaclav Smil. "Fast Trains Are Energy Efficient (And Fast)," December 26, 2018. https://spectrum.ieee.org/transportation/mass-transit/fast-trains-are-energy-efficient-and-fast.

"What Is the U.S. National Debt Right Now — and Why Is It so High?" Pgpf.org, 2021. https://www.pgpf.org/national-debt-clock.

Yglesias, Matthew. "Amtrak Turns 45 Today. Here's Why American Passenger Trains Are so Bad." Vox. Vox, May 2016. https://www.vox.com/2016/5/1/11539966/amtrak-45-anniversary.

# TOPIC B: AVIATION EMISSIONS AND REGULATIONS

## Statement of the Problem

***Introduction to the Problem***

The US aviation industry is the largest contributor of greenhouse gas emissions of the US transportation sector, which is already the largest contributor to total annual US carbon dioxide ($CO_2$) emissions.[100] In 2018, it was found by the Environmental Protection Agency (EPA) that 3 percent of the total carbon dioxide emissions in the US were from aircraft emissions, with commercial passenger flights constituting 81 percent of that 3 percent.[101] More broadly, the US aviation industry makes up 24 percent of global aviation emissions and more than 2 percent of total global carbon dioxide emissions.[102] Global aviation emissions are projected to triple by 2050 if the current growth rate continues, with passenger flights being the biggest and fastest growing contributor to greenhouse gas emissions globally.[103] Since air travel became the primary method of long-distance travel in the US and the world, aviation emissions have increased every year at a pace faster than technologies in fuel efficiency advance.[104] Nevertheless, federal regulations on airplane emissions remain highly limited.[105]

Historically, the exact environmental and public health impact of aviation emissions was uncertain, as few definitive tests were conducted on the industry. However, in 2016, the EPA published definitive findings that certain aviation emissions pose a direct threat to human health through noise and air pollution, as well as their contribution to climate change.[106] In July 2020, the EPA found that

[100] "Reducing Carbon Dioxide Emissions from Aircraft," Center for Climate and Energy Solutions, July 22, 2020, https://www.c2es.org/content/reducing-carbon-dioxide-emissions-from-aircraft/.
[101] "Ibid."
[102] Jeff Overton, "Fact Sheet: The Growth in Greenhouse Gas Emissions from Commercial Aviation | White Papers | EESI," Environmental and Energy Study Institute (EESI) (October 17, 2019), https://www.eesi.org/papers/view/fact-sheet-the-growth-in-greenhouse-gas-emissions-from-commercial-aviation.
[103] "Ibid."
[104] "Reducing Carbon Dioxide Emissions from Aircraft," Center for Climate and Energy Solutions, July 22, 2020, https://www.c2es.org/content/reducing-carbon-dioxide-emissions-from-aircraft/.
[105] "Ibid."
[106] Environmental Protection Agency, "Final Rule for Finding That Greenhouse Gas Emissions from Aircraft Cause or Contribute to Air Pollution That May Reasonably Be Anticipated to Endanger Public Health and Welfare | US EPA," US

greenhouse gas emissions from all aircraft endanger public health and welfare. Therefore, under the authority of the Clean Air Act, the EPA is obligated to set standards of greenhouse gas emissions from aircraft.[107][108] In December 2020, the EPA put in place the first airplane emissions rules in US history based on international standards set by the International Civil Aviation Organization (ICAO) in 2017 for fuel efficiency and carbon dioxide emissions reduction minimums.[109] These standards require reductions in fuel consumption based on maximum aircraft takeoff mass and range from 0 to 11 percent, with an average of 4 percent.[110] The rule requires that by 2028, all aircraft must meet those standards, but critics and the EPA itself have said that this new regulation will be ineffective. This is because, currently, major aircraft manufacturers either already meet the standards, or will meet them by 2028 at the rate that aircraft efficiency is progressing technologically.[111] When the ruling takes full effect in 2028, minimal changes to aircrafts will be required to meet this fuel efficiency standard.

The Federal Aviation Administration (FAA) under the Department of Transportation (DOT) released a statement following the EPA's rule detailing that they will work with the EPA to implement the new regulations.[112] This statement is significant because while the EPA does not have enforcement

---

EPA, n.d., https://www.epa.gov/regulations-emissions-vehicles-and-engines/final-rule-finding-greenhouse-gas-emissions-aircraft.

[107] Sungjoo Ahn, "EPA's New Aviation Emissions Standard: Why It's Already Obsolete - Environmental & Energy Law Program," Harvard Law School, February 25, 2021, https://eelp.law.harvard.edu/2021/02/epas-aviation-emissions-standard/.

[108] Jeff Overton, "Fact Sheet: The Growth in Greenhouse Gas Emissions from Commercial Aviation | White Papers | EESI," Environmental and Energy Study Institute (EESI) (, October 17, 2019), https://www.eesi.org/papers/view/fact-sheet-the-growth-in-greenhouse-gas-emissions-from-commercial-aviation.

[109] Federal Aviation Administration, "Press Release – FAA Statement on EPA Airplane Greenhouse Gas Emissions Rule," www.faa.gov, December 28, 2020, https://www.faa.gov/news/press_releases/news_story.cfm?newsId=25540&omniRss=press_releasesAoc&cid=102_P_R.

Reese Oxner, "U.S. Implementing 1st-Ever Airplane Emission Rules; Critics Say They're Ineffective," NPR.org, December 28, 2020, https://www.npr.org/2020/12/28/950863508/u-s-implementing-1st-ever-airplane-emission-rules-critics-say-theyre-ineffective.

[110] "International Civil Aviation Organization's CO2 Standard for New Aircraft," The International Council on Clean Transportation, January 2017, https://theicct.org/sites/default/files/publications/ICCT-ICAO_policy-update_revised_jan2017.pdf.

[111] Reese Oxner, "U.S. Implementing 1st-Ever Airplane Emission Rules; Critics Say They're Ineffective," NPR.org, December 28, 2020, https://www.npr.org/2020/12/28/950863508/u-s-implementing-1st-ever-airplane-emission-rules-critics-say-theyre-ineffective.

Jeff Overton, "Fact Sheet: The Growth in Greenhouse Gas Emissions from Commercial Aviation | White Papers | EESI," Environmental and Energy Study Institute (EESI) (, October 17, 2019), https://www.eesi.org/papers/view/fact-sheet-the-growth-in-greenhouse-gas-emissions-from-commercial-aviation.

[112] Federal Aviation Administration, "Press Release – FAA Statement on EPA Airplane Greenhouse Gas Emissions Rule," www.faa.gov, December 28, 2020, https://www.faa.gov/news/press_releases/news_story.cfm?newsId=25540&omniRss=press_releasesAoc&cid=102_P_R.

power over the aviation industry, the FAA does.[113] The FAA can include the requirements set by the EPA into their certification process for new airplanes put on the market. The two agencies will cooperate to make sure US airlines are in line with the ICAO's standards.[114] But, as mentioned earlier, this promise is essentially performative, because airlines will need to make few actual changes.

***Impact of Aviation Emissions on Climate Change, the Environment, and Human Health***

According to the FAA, aviation had numerous effects on the environment, including air pollution from engine emissions, water pollution from airport runoff, and noise pollution to communities near airports. Roughly 90 percent of aviation pollution is emitted in the air at altitudes of 3000 feet or above, while ground operations relating to aviation contribute the remaining 10 percent.[115]

The largest component of aviation emissions is carbon dioxide, comprising about 70 percent of emissions.[116] Carbon dioxide has a direct warming effect on the atmosphere by trapping in heat. Carbon dioxide remains trapped in the atmosphere for thousands of years, creating a compounding effect on the rate of climate change. The other main component of aviation emissions is water vapor, which makes up about 30 percent of emissions and can be seen as contrails in the sky.[117] These contrails have an indirect warming effect by freezing as ice crystals that can trap infrared rays in clouds, which has a warming effect of up to 3 times that of carbon dioxide.[118] The remaining less than 1 percent of emissions is particulate matter and various gases including ozone ($O_3$), nitrogen oxides, and sulfates.[119] These compounds have a mixed cooling and warming effect on the atmosphere, but have a net warming effect similar to that of contrails by trapping in heat.

[113] "Ibid."
[114] "Ibid."
[115] Sandy Webb, "Aviation Emissions, Impacts & Mitigation: A Primer, January 2015," (US FAA, 2015), https://www.faa.gov/regulations_policies/policy_guidance/envir_policy/media/Primer_Jan2015.pdf.
[116] Jeff Overton, "Fact Sheet: The Growth in Greenhouse Gas Emissions from Commercial Aviation | White Papers | EESI," Environmental and Energy Study Institute (EESI) (October 17, 2019), https://www.eesi.org/papers/view/fact-sheet-the-growth-in-greenhouse-gas-emissions-from-commercial-aviation.
[117] "Ibid."
[118] "Ibid."
[119] "Ibid."

Found at both low and high altitudes, these emissions decrease air quality and have harmful impacts on human health. Ground level aviation operations produce the same emissions that airplanes do once in the sky, which increases risk of death by lung problems and cancer, particularly for aviation industry workers.[120]

***Obstacles to Increased Aviation Emissions Regulations***

Although there has been a recent and long overdue push by the FAA and EPA for aviation emissions regulations, there are major obstacles that may prevent implementation. The obstacles are bureaucratic as well as logistical in nature.

Aviation emissions produce greenhouse gases, which become trapped in the atmosphere and accelerate climate change. Currently, aviation contributes to 3.5 percent of human-caused warming of the planet.[121][122] Due to the lack of centralized international data on the exact impacts of aviation emissions, it is difficult to quantify the changes that are necessary to mitigate them. Consequently, global carbon neutral goals are minimally effective.

The simplest way to reduce aviation emissions is to reduce commercial passenger air travel, as that contributes to over 80 percent of aviation emissions. However, the demand for long distance travel is high and people need viable alternatives to flying. A high-speed rail would be the most efficient alternative to flying, and more environmentally friendly, but the US does not have a national high speed rail network and there are minimal other long-distance transportation options.

[120] Flávio D A Quadros, Mirjam Snellen, and Irene C Dedoussi, "Regional Sensitivities of Air Quality and Human Health Impacts to Aviation Emissions," *Environmental Research Letters* 15, no. 10 (October 7, 2020): 105013, https://doi.org/10.1088/1748-9326/abb2c5.
[121] David S. Lee and Piers Forster, "Guest Post: Calculating the True Climate Impact of Aviation Emissions," Carbon Brief, September 21, 2020, https://www.carbonbrief.org/guest-post-calculating-the-true-climate-impact-of-aviation-emissions.
[122] "Ibid."

The airline industry has been successful in lobbying the DOT for exemptions to overall transportation sector emissions regulations.[123] With the coronavirus pandemic, the market for air travel took a major hit and the airline industry has needed government bailouts to stay in business.[124]A government bailout is when the government provides financial support to a business that is in trouble to prevent bankruptcy.[125] In March 2020, the US Senate signed an airline relief package that did not include any conditions requiring increased environmental consciousness by airlines. Initially, the bailout included various measures on climate change mitigation, but airline companies refused to accept those terms.[126] Critics were frustrated by the delay in environmental regulations put on airlines, as the companies have consistently pushed back on attempted regulations for decades.[127]

Compared to other transportation sectors, such as automobiles, it is more difficult to shift aviation away from fossil fuels. The size and energy consumption of aircraft makes turning towards electricity tough.[128] Instead, converting to biofuel usage is the main focus of getting aviation to eliminate greenhouse gas emissions. Currently, sustainable aviation fuel (SAF) accounts for less than one percent of overall aircraft fuel use.[129] SAF is also more expensive than conventional fuel, which will put additional costs on airlines. Further, aircraft currently in use are unable to run on 100 percent SAF, although aircraft manufacturers are working to produce aircraft that are able to run completely on SAF by around 2030.[130]

Furthermore, airline companies would need to partially or completely replace their fleets to meet sustainable fuel goals. Aircraft are long lasting, staying active in a fleet for an average of 30-35 years.

---

[123] Edward Hasbrouck, "The Biden Administration Wants to 'Build Back Better'—What Could That Mean for Air Travel?," Sierra Club, June 25, 2021, https://www.sierraclub.org/sierra/biden-administration-wants-build-back-better-what-could-mean-for-air-travel.
[124] Jocelyn Timperley, "'No Time for Requirements': Aviation Industry Lobbying against Green Strings in Coronavirus Bailouts," DeSmog, April 3, 2020, https://www.desmog.com/2020/04/03/no-time-requirements-aviation-industry-lobbying-against-coronavirus-bailout-green-strings/.
[125] Wex Definitions Team, "Bailout," Cornell Law School Legal Information Institute, accessed August 14, 2021, https://www.law.cornell.edu/wex/bailout#:~:text=A%20bailout%20is%20when%20the.
[126] Jocelyn Timperley, "'No Time for Requirements': Aviation Industry Lobbying against Green Strings in Coronavirus Bailouts," DeSmog, April 3, 2020, https://www.desmog.com/2020/04/03/no-time-requirements-aviation-industry-lobbying-against-coronavirus-bailout-green-strings/.
[127] "Ibid."
[128] Allison Lampert and Stephanie Kelly, "EXCLUSIVE U.S. Weighs 2050 Target in Bid to Wean Airlines off Fossil Fuels," Reuters, August 10, 2021, https://www.reuters.com/business/aerospace-defense/exclusive-us-weighs-2050-target-bid-wean-airlines-off-fossil-fuels-2021-08-10/.
[129] "Ibid."
[130] "Ibid."

The rate of aircraft replacement and industry growth predicts that we won't have a fleet composed solely of planes with advanced fuel technologies compatible with efficiency goals until about 2040.[131] More rapid replacement would be very costly for airlines. The aviation industry has recognized the importance of reducing its carbon emissions, but is insistent that they need incentives and monetary assistance to offset the cost of making the switch to carbon-neutral fuel.[132] Much of the technology to move towards low-carbon and carbon-neutral operations either already exists or is feasible in the near future if adequate resources are allocated towards its development. However, this is costly and airlines do not have much incentive to invest in clean aircraft technology and fuel without government subsidies.[133]

[131] Sandy Webb, "Aviation Emissions, Impacts & Mitigation: A Primer, January 2015," (US FAA, 2015), https://www.faa.gov/regulations_policies/policy_guidance/envir_policy/media/Primer_Jan2015.pdf.
[132] Stephanie Kelly, "Airlines, Renewables Companies Push Biden to Make Air Travel Greener," *Reuters*, February 19, 2021, https://www.reuters.com/article/us-usa-energy-aviation/airlines-renewables-companies-push-biden-to-make-air-travel-greener-idUSKBN2AJoLH.
[133] "Ibid."

# History of the Problem

***Introduction***

Before beginning to find solutions for how to reduce the impact of commercial aviation emissions on climate change, the environment, and human health as passenger flight travel continues to grow, it is important to understand the history of commercial aviation in the US that has led to its current status quo. Additionally, it is important to understand the FAA's history and its role as an agency for the oversight of aviation emissions regulations, as well as the joint involvement of the EPA in pushing for stricter environmental protection measures.

***History of Commercial Aviation***

Commercial aviation began with the Wright Brothers' first successful flight on December 17, 1903, as it led to the continued development of aircraft technology through the 20th century into the present day.[134] The Air Mail Act of 1925 allowed for the creation of the commercial aviation industry, and by the mid-1930s, major commercial airlines including United and American were founded.[135] However, passenger flights were dangerous at the time and aircraft were used primarily for cargo shipments. During World War II, commercial aviation took a pause as aircraft were used almost exclusively for the war effort.[136] Following the end of World War II, commercial aviation experienced a boom and grew rapidly in the 1950s.[137]

***History of the Federal Aviation Administration***

*Precursors*

In 1926, the Air Commerce Act was passed, which allowed the Secretary of Commerce to create and enforce air traffic rules, license pilots, certify aircraft, establish airways, and operate air navigation.

[134] Federal Aviation Administration, "A Brief History of the FAA," Faa.gov, 2017, https://www.faa.gov/about/history/brief_history/.
[135] "Ibid."
[136] Aviation Oil Outlet, "The Early History of Commercial Air Travel," Aviation Oil Outlet, May 3, 2017, https://aviationoiloutlet.com/blog/early-history-commercial-air-travel/.
[137] "Ibid."

This came after a push by aviation industry leaders for the federal government to take action to create and regulate safety standards due to the dangers of early aviation, following public outcry to increase safety in the industry.[138] The Department of Commerce created an Aeronautics Branch to deal with the oversight of aviation.[139] The Aeronautics Branch of the Department of Commerce was renamed as the Bureau of Commerce in 1934 to signify its increasing importance. After this official change, the Bureau advocated for the establishment of air traffic control (ATC) centers to help guide aircraft on flights, and in 1936, took control over them. The Bureau was only in control of ATC centers, while local governments operated airport towers, yet it was the Bureau that was ultimately held responsible for safety accidents.[140]

In 1938, President Franklin Roosevelt signed the Civil Aeronautics Act to establish the Civil Aeronautics Authority (CAA) with an Air Safety Board to conduct independent investigations of aviation accidents and make recommendations for prevention measures for the future. This law also expanded the federal government's role in aviation regulation, allowing the CAA to regulate airline prices, determine routes, and conduct accident investigations.[141] With this high level of government involvement in the industry, airline companies enjoyed some sense of stability. For example, since prices were set by the government and were thus less susceptible to changes in the market, a certain amount of profits was guaranteed for these companies. On the flip side, government involvement also meant that they were under tight control, limiting the pace of progress for aviation.[142]

In 1940, the original CAA was split into two agencies, with the new CAA becoming part of the Department of Commerce under the same name and the Civil Aeronautics Board (CAB) being created. The CAA still had oversight of the ATC, certification, safety enforcement, and airway

[138] Joshua Dempsey, Wendy Beckman, and Ronald Ferrara, "The Impact of Government Policy on Airline Profitability" (December 2013), https://jewlscholar.mtsu.edu/bitstream/handle/mtsu/3604/Dempsey_mtsu_0170N_10188.pdf?sequence=1&isAllowed=y.
[139] Federal Aviation Administration, "A Brief History of the FAA," Faa.gov, 2017, https://www.faa.gov/about/history/brief_history/.
[140] "Ibid."
[141] "Ibid."
[142] Joshua Dempsey, Wendy Beckman, and Ronald Ferrara, "The Impact of Government Policy on Airline Profitability" (December 2013), https://jewlscholar.mtsu.edu/bitstream/handle/mtsu/3604/Dempsey_mtsu_0170N_10188.pdf?sequence=1&isAllowed=y.

development, while the CAB was in charge of creating safety regulations, investigating accidents, and setting airline prices.[143]

**The Federal Aviation Agency**

On August 23, 1958, the Federal Aviation Act was passed to transfer the functions of the CAA to a newly created Federal Aviation Agency that was responsible for aviation safety and independent of the Department of Commerce. In 1966, the Department of Transportation was created as a coordinated department to deal with transportation in the US. As part of the DOT's creation, the Agency was renamed the Federal Aviation Administration as a modal organization. The CAB's authority was transferred to the National Transportation Safety Board.[144]

**Evolution of the Federal Aviation Administration and Its Duties**

As aircraft and aviation continued to evolve technologically and economically, the FAA assumed new and changing responsibilities. In the late 1960s, as the commercial profitability of aviation grew, there was a growing concern about air pollution and noise pollution from aircraft. This led the FAA to create aircraft noise standards. The economic boom of the aviation industry also led to increased airport capacity and safety needs. In 1970, the Airport and Airway Development Act put the FAA in charge of airport safety certification.[145]

***Government Involvement in Aviation Regulations***

*Deregulation*

In 1978, the Airline Deregulation Act was signed to allow a free market airline industry. A free market, also known as "laissez-faire capitalism," is an economic system in which prices are determined by unregulated or minimal government-regulated competition between businesses in

[143] Federal Aviation Administration, "A Brief History of the FAA," Faa.gov, 2017, https://www.faa.gov/about/history/brief_history/.
[144] "Ibid."
[145] "Ibid."

the same market.[146] The FAA had previously regulated virtually every aspect of the industry from prices to routes.[147] The goal of this law was to increase passenger numbers and industry profitability. Airlines could set their own prices, but had to set them at lower rates due to competition from other airlines. This allowed air travel to be more affordable for more people, so the aviation industry saw increased numbers of customers and tickets sold after the passage of this law.[148]

While initially airline shareholders lost money and smaller companies went out of business, overall, this act led to growth in the industry as flying became more affordable and options expanded with more airlines in the market. Airlines developed new business models to provide good service at affordable costs and the hub-and-spoke network became the new route model. The hub-and-spoke model is the air traffic method of having a central airport serve as a coordinating point to other airports.

Although the government was no longer involved in economic regulation of the industry, they increased their involvement in setting safety and security standards.[149] These types of regulations included anti-terrorism measures, better labor protections, and environmental protection measures. However, this hurt the profitability of airlines due to increasing costs for running an airline that met all new safety and security standards, adding on to the impact of hypercompetition between airlines resulting from a free market.[150]

The FAA continues to make regulations concerning accidents, security, and environmental protection, as well as passenger protections. However, many analysts argue that the financial cost of increased regulation outweighs the benefits of increased protections, leading to a debate surrounding the extent to which the FAA should be involved in the aviation industry.[151]

---

[146] Jim Chappelow, "Free Market Definition," Investopedia, April 28, 2020, https://www.investopedia.com/terms/f/freemarket.asp.
[147] Robert Peterson, "Impacts of Airline Deregulation," TR News, June 2018, http://onlinepubs.trb.org/onlinepubs/trnews/trnews315airlinedereg.pdf.
[148] "Ibid."
[149] Joshua Dempsey, Wendy Beckman, and Ronald Ferrara, "The Impact of Government Policy on Airline Profitability" (December 2013), https://jewlscholar.mtsu.edu/bitstream/handle/mtsu/3604/Dempsey_mtsu_0170N_10188.pdf?sequence=1&isAllowed=y.
[150] "Ibid."
[151] "Ibid."

***Recent Debates in Federal Aviations Regulations***

*Economic Issues*

Economic issues including high taxation, government fines for consumer protection, and government bailouts have led to debates over the limitation of growth for the aviation industry.[152] The aviation industry claims that the increased cost of operations leads to decreases in passengers and therefore a decrease in profits and a decline in service, fiscally devastating the industry.[153] The economic cost of more stringent environmental regulations has ignited pushback from airlines, with some companies citing the unfairness of needing to double pay fines due to overlapping regulations.[154]

The DOT argues that these taxes and consumer protection fines are necessary to ensure safety of aviation by reducing accidents directly related to restricted activities such as the transport of dangerous goods. According to the DOT, the benefits of regulation are clear and are more important than the financial costs put on airlines because increased safety measures will boost public willingness to fly.[155]Also, since there is little faith in the industry to impose safety and environmental regulations on its own, the DOT emphasizes the necessity of fines and taxes to ensure some level of safety regulation exists, despite allowing the industry to be largely self-regulatory.[156]

*Government Involvement and Free Market*

Despite the deregulation act, the federal government is still involved in the airline industry. Government involvement through safety and environmental regulations protects passengers and facilitates a healthier growth of the industry. Further, the federal government also prevents airline

[152] "Ibid."
[153] "Ibid."
[154] Kate Abnett and Tim Hepher, "EU Targets Airlines in Major Climate Policy Shakeup," Reuters, July 14, 2021, https://www.reuters.com/business/aerospace-defense/eu-climate-blueprint-pressures-airlines-cut-emissions-2021-07-14/.
[155] Joshua Dempsey, Wendy Beckman, and Ronald Ferrara, "The Impact of Government Policy on Airline Profitability" (December 2013), https://jewlscholar.mtsu.edu/bitstream/handle/mtsu/3604/Dempsey_mtsu_0170N_10188.pdf?sequence=1&isAllowed=y.
[156] "Ibid."

collapse through bailouts, which allow airlines to shift their debts and remain afloat.[157] The airline industry is economically sensitive, meaning it reacts in a disproportionately large magnitude to small changes in its underlying factors. The airline industry is considered an essential industry by the government, so its survival is a priority.[158]

On the other hand, economists argue that these interventions (regulations and bailouts) by the government negate the supposed free market that airlines operate in. According to economic experts, the aviation industry operates as a subsidized oligopoly.[159] An oligopoly is when a market is dominated by a few companies that influence each other's business decisions and work together to artificially inflate prices.[160] A subsidy is when the government gives benefits to an industry through tax breaks or money payments to help offset costs.[161] Critics of the government subsidization of the aviation industry say this market model has led to inefficiency, limited growth, and inflated prices, and ultimately stifled potential profits.[162]

***Environmental Protection Agency Joint Involvement***

The EPA works to set regulations for aviation emissions based on their environmental impact, and the FAA has enforcement power over EPA standards.[163] The FAA has a "commitment to environmental protection that allows sustained aviation growth."[164] To fulfill this goal, the FAA's Next Generation Air Transportation System (NextGen) works to establish policies for more efficient air travel that minimizes aviation's environmental impact. The FAA works closely with the EPA to ensure that policies implemented are not detrimental to human and environmental health.[165]

---

[157] "Ibid."
[158] "Ibid."
[159] "Ibid."
[160] Jim Chappelow, "Oligopoly," Investopedia, March 29, 2019, https://www.investopedia.com/terms/o/oligopoly.asp.
[161] Gordon Scott, "Subsidy," Investopedia, 2019, https://www.investopedia.com/terms/s/subsidy.asp.
[162] Joshua Dempsey, Wendy Beckman, and Ronald Ferrara, "The Impact of Government Policy on Airline Profitability" (December 2013), https://jewlscholar.mtsu.edu/bitstream/handle/mtsu/3604/Dempsey_mtsu_0170N_10188.pdf?sequence=1&isAllowed=y.
[163] Federal Aviation Administration, "Press Release – FAA Statement on EPA Airplane Greenhouse Gas Emissions Rule," www.faa.gov, December 28, 2020, https://www.faa.gov/news/press_releases/news_story.cfm?newsId=25540&omniRss=press_releasesAoc&cid=102_P_R.
[164] Sandy Webb, "Aviation Emissions, Impacts & Mitigation: A Primer, January 2015," (US FAA, 2015), https://www.faa.gov/regulations_policies/policy_guidance/envir_policy/media/Primer_Jan2015.pdf.
[165] "Ibid."

### *Clean Air Act*

The Clean Air Act was passed in 1970 as a comprehensive law to regulate air emissions.[166] The Act established the National Ambient Air Quality Standards (NAAQS) to protect public health and welfare.[167] The Act has had revisions in 1977 and 1990 to update the law's relevancy. In Section 231(a)(2)(A), the EPA is granted broad regulatory authority over aviation emissions at the discretion of the EPA Administrator by issuing proposed emissions standards that are applicable to any aircraft.[168] It is important for the EPA to be diligent in setting these standards, as the Clean Air Act prevents state governments from setting their own aviation emissions standards.[169]

Through this authority, the EPA has historically regulated pollutants including smoke, hydrocarbons, and carbon monoxide, but has remained conservative in the extent of the limitations set.[170] While the EPA regulations in the past have been equally as stringent as the ICAO standards, greenhouse gas emissions have not been limited, nor have other pollutants that do not have any international standards.[171]

### *Recent EPA Action Regarding Aviation Emissions*

In January 2021, the EPA issued its first ever greenhouse gas emission standard regarding pollutants that are known to be harmful. Specifically, the ruling adopted the carbon dioxide limits set by the ICAO in 2017. The regulation applies to airplanes in production after 2028. However, critics of the new rule and the EPA itself do not believe the new standard will lead to any substantial emissions reductions. The ICAO standards from 2017 were based on technological feasibility at the time. In the present, many airplane manufacturers have already met those standards with improvements in

[166] Environmental Protection Agency, "Summary of the Clean Air Act | US EPA," US EPA, August 15, 2018, https://www.epa.gov/laws-regulations/summary-clean-air-act.
[167] "Ibid."
[168] Sungjoo Ahn, "EPA's New Aviation Emissions Standard: Why It's Already Obsolete - Environmental & Energy Law Program," Harvard Law School, February 25, 2021, https://eelp.law.harvard.edu/2021/02/epas-aviation-emissions-standard/.
[169] "Ibid."
[170] "Ibid."
[171] "Ibid."

aviation technology. Therefore, this ruling does nothing in effect to change the level of emissions output by the aviation industry.[172]

### *Historical Lack of Aviation Emissions Regulations*

The historical lack of greenhouse gas regulations by the US government can be attributed to the omission of the aviation sector from the Kyoto Protocol and the Paris Climate Agreement.[173] The Kyoto Protocol was adopted in 1997 as an international commitment among industrially developed countries to reduce greenhouse gases based on individually set targets.[174] The Paris Climate Agreement is an international treaty that was adopted in 2016 with a goal to limit global warming by reducing greenhouse gas emissions to reach the goal of a climate neutral world by 2050.[175] Under the Trump Administration, the U.S. withdrew from the Paris Agreement in 2017 and was no longer bound by its regulations.[176] Recently, the new Biden Administration rejoined the Paris Agreement with promises to be a global leader on addressing climate change.[177]

[172] "Ibid."
[173] "Ibid."
[174] United Nations Climate Change, "What Is the Kyoto Protocol? | UNFCCC," Unfccc.int (UNFCCC, 2019), https://unfccc.int/kyoto_protocol.
[175] United Nations Framework Convention on Climate Change, "The Paris Agreement," UNFCCC (United Nations, 2016), https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement.
[176] Matt McGrath, "Climate Change: US Formally Withdraws from Paris Agreement," *BBC News*, November 4, 2020, sec. Science & Environment, https://www.bbc.com/news/science-environment-54797743#:~:text=After%20a%20three%2Dyear%20delay.
[177] Nathan Rott, "Biden Moves to Have U.S. Rejoin Climate Accord," NPR.org, January 20, 2021, https://www.npr.org/sections/inauguration-day-live-updates/2021/01/20/958923821/biden-moves-to-have-u-s-rejoin-climate-accord.

# Past Actions

### *Minimal Action Historically*

As previously stated, regulations on aviation emissions have been historically absent, with aviation being the only industry of the transportation sector without regulations specifically regarding carbon emissions and other greenhouse gases. According to the Sierra Club, the FAA "has never been interested in controlling aviation emissions."[178] However, there have been varying amounts of regulations for aircraft safety and economic regulations on the industry, so there is precedent for general airline regulations. As air travel continues to grow at exponential rates, increasing its already disproportionate impact on climate change, the need for action from the federal government to combat the impacts of aviation on the environment and human health while still allowing for economic growth in the industry is increasingly dire.

### *Obama Administration*

Overall, the Obama administration was unsuccessful in implementing effective aviation emissions standards. In 2012, President Obama "signed a law excluding US airlines from the European Union's carbon trading scheme," which critics pointed out was in contradiction to the administration's second term promise for stronger action against climate change.[179] The law had strong backing from airline companies, who argued that the EU carbon tax was unfair as it required them to pay carbon taxes on the entire duration of international flights, not just during flight through European air.[180] The White House released a statement following criticism stating that Obama did not want to subject domestic companies to foreign policies and preferred to deal with aviation emissions through working with the ICAO.[181]

---

[178] Edward Hasbrouck, "The Biden Administration Wants to 'Build Back Better'—What Could That Mean for Air Travel?," Sierra Club, June 25, 2021, https://www.sierraclub.org/sierra/biden-administration-wants-build-back-better-what-could-mean-for-air-travel.
[179] Suzanne Goldenberg, "Obama Fails First Climate Test by Rejecting EU Aviation Carbon Regime," The Guardian, November 28, 2012, https://www.theguardian.com/world/2012/nov/28/obama-fails-climate-test-aviation.
[180] "Ibid."
[181] "Ibid."

In 2015, the Obama Administration proposed regulations on aviation emissions to limit their threat to human health and contribution to global warming.[182] The administration cited that under the authority established by the Clean Air Act, the US government has the power to enact emissions limits based on international standards.[183] At the time, however, the Obama administration was reaching the end of its term and the ICAO had not yet finalized their standards. It would not be until shortly after the Obama administration stepped down in 2017 that the ICAO published new standards, so in effect this proposal changed nothing about US aviation emissions regulations.[184]

In April 2016, Earthjustice filed a lawsuit on behalf of the Center for Biological Diversity against the Obama Administration-run EPA for failures to limit pollution from US aircraft by dragging out the setting of emissions standards.[185] The lawsuit claimed that the EPA was required under the Clean Air Act to "issue emission standards for any aircraft pollutant that 'may reasonably be anticipated to endanger public health or welfare'" and had not yet issued any aircraft regulations.[186] With increasingly clear evidence that aviation emissions "significantly accelerate" climate change, the lawsuit demanded immediate action from the Obama Administration to combat aircraft pollution.[187] The lawsuit also stated that reductions in emissions were immediately feasible according to a report by the Council of Clean Transportation.[188]

***Trump Administration***

At the beginning of the Trump administration in 2017, President Trump had announced his intention to pull out of the Paris Climate Agreement that the US joined in 2015 with promises to reduce

[182] Joan Lowry, "Obama Administration Proposes Regulation of Aircraft Emissions," PBS, June 10, 2015, https://www.pbs.org/newshour/nation/obama-administration-proposes-regulation-aircraft-emissions.
[183] "Ibid."
[184] "Ibid."
[185] Center for Biological Diversity, "Lawsuit Challenges Obama Administration's Failure to Curb Airplane Carbon Pollution," www.biologicaldiversity.org, April 12, 2016, https://www.biologicaldiversity.org/news/press_releases/2016/airplane-emissions-04-12-2016.html.
[186] "Ibid."
[187] "Ibid."
[188] "Ibid."

greenhouse gas emissions.[189] This derailed the US's original goal from 2015, when the Obama Administration promised to reduce its emissions by 25% by 2025 from its emissions levels in 2005.[190]

Throughout its singular term in office, the Trump administration had a poor track record with climate change action, as it rolled back over 100 environmental rules and regulations previously in effect.[191] In July 2020, the Trump administration EPA administrator announced a proposal to regulate aircraft greenhouse gas emissions for the first time in the country's history. However, the Trump administration admitted that these new emissions standards would not actually reduce future greenhouse gas emissions. The aviation industry had previously imposed their own independent standards and the EPA's proposal was not stricter than those existing ones. This action was redundant and performative to boost the environmentally conscious image of the Trump administration in the face of re-election.[192] Additionally, this allowed the Trump administration to avoid a potential lawsuit claiming inaction per the Clean Air Act requirement to set aviation emissions standards similar to the one the Obama administration had faced.[193]

In December 2020, the Center for Biological Diversity published a statement condemning the Trump Administration for its failure to reduce greenhouse gas emissions from aviation, calling the new standards an "industry handout" that allowed it to keep operating without any changes to climate pollution.[194] In fact, the statement also underlined that the EPA's standards are more outdated than current aircraft technology by over 10 years and will not apply to new aircraft until 2028.[195] The Center also announced in this statement that if the incoming Biden administration did not

[189] Rebecca Hersher, "U.S. Officially Leaving Paris Climate Agreement," NPR.org, November 3, 2020, https://www.npr.org/2020/11/03/930312701/u-s-officially-leaving-paris-climate-agreement.
[190] "Ibid."
[191] Kristoffer Tigue and Marianne Lavelle, "Draft Airline Emission Rules Are the Latest Trump Administration Effort to Change Its Climate Record," Inside Climate News, July 23, 2020, https://insideclimatenews.org/news/23072020/airlines-epa-andrew-wheeler-greenhouse-gas-emissions-trump/.
[192] "Ibid."
[193] "Ibid."
[194] Center for Biological Diversity, "Trump Administration Finalizes Do-Nothing 'Standards' for Airplane Climate Emissions," Center for Biological Diversity, December 28, 2020, https://biologicaldiversity.org/w/news/press-releases/trump-administration-finalizes-do-nothing-standards-for-airplane-climate-emissions-2020-12-28/.
[195] "Ibid."

immediately replace the Trump administration's rule, it would take legal action against the Biden administration.[196]

The Environmental Defense Fund also released a statement in December 2020 condemning the Trump administration's "idling on aviation pollution."[197] Specifically, they pointed out that not only were the new standards ineffective and inadequate, they also failed to address the indirect impact of aviation emissions on airport workers and local communities, only focusing on the physical aircraft.[198]

***Biden Administration***

The Biden administration rejoined the Paris Climate Agreement in 2021 as one of its first actions in office, promising to be serious about addressing climate change concerns.[199] In February 2021, the Biden administration met with representatives from airlines to discuss reducing emissions and pushing towards using more eco-friendly biofuels.[200] Environmentalists have urged Biden to focus on creating tougher emissions standards rather than giving tax breaks for biofuel usage.[201] The Biden administration is heavily focusing on its goal to have all aircraft fly on 100 percent renewable energy by 2050, and is considering incentives for airlines that move towards sustainable fuel.[202]

During a town hall in March 2021, the FAA administrator emphasized that dealing with climate change is a "huge priority" for the Biden administration. Specifically, the administration is focusing on sustainable aviation fuel. However, the current supply of available biofuel is very limited. Sourcing

[196] "Ibid."
[197] Annie Petsonk, "Trump EPA: Idling on Aviation Pollution," Environmental Defense Fund, December 28, 2020, https://www.edf.org/media/trump-epa-idling-aviation-pollution.
[198] "Ibid."
[199] Nathan Rott, "Biden Moves to Have U.S. Rejoin Climate Accord," NPR.org, January 20, 2021, https://www.npr.org/sections/inauguration-day-live-updates/2021/01/20/958923821/biden-moves-to-have-u-s-rejoin-climate-accord.
[200] David Koenig, "Airline CEOs, Biden Officials Consider Green-Fuel Breaks," AP NEWS, April 20, 2021, https://apnews.com/article/scott-kirby-climate-climate-change-airlines-pete-buttigieg-6bed112b680f66762efe9a6ebf476c31.
[201] "Ibid."
[202] Edward Russell, "Biden Transportation Department Zeros in on Aviation Emissions in Climate Push," Airline Weekly, March 5, 2021, https://airlineweekly.com/2021/03/biden-transportation-department-zeros-in-on-aviation-emissions-in-climate-push/.

enough biofuel to meet the goal of the aviation sector completely being run on renewable energy is a large challenge for the current administration.[203]

[203] "Ibid."

# Possible Solutions

***Introduction***

The goal of this committee is to set effective aviation emissions regulations for the US. Therefore, doing nothing and allowing the airline industry to run as it does currently is not a productive outcome, though it is technically an option. In August 2021, the UN released a climate change report that outlines the dire state of climate change and rate of global warming due to greenhouse gas emissions by human activity.[204] Immediate, large-scale action is needed to limit the increase of average global temperature. Aviation is a significant contributor to the unprecedented level of greenhouse gas emissions and must be significantly regulated as part of the solution. Decarbonization of aviation emissions is complex and there are numerous measures that could be taken to move towards the goal of being carbon-neutral by 2050, so do not think of the following possible solutions as mutually exclusive. This is also not an exhaustive list of potential solutions.

***Business As Usual***

According to the EPA's "business as usual" emissions trajectory of the industry's growth, there is predicted to be "5 billion tons of $CO_2$ between 2020 and 2040" coming from aviation.[205] Business as usual is defined as how the industry is projected to run if it continues to operate as it presently does with no changes to current regulations. This is not a viable option as aviation is one of the top and fastest growing contributors to carbon emissions globally.

***Mandates for Carbon Emissions Taxes and Reductions***

In July 2021, the European Union (EU) decided to introduce progressive taxes on non- carbon neutral flights within the EU and required that airlines cut emissions by a minimum of 55 percent by 2030

[204] Nina Chestney and Andrea Januta, "U.N. Climate Change Report Sounds 'Code Red for Humanity,'" Reuters, August 9, 2021, https://www.reuters.com/business/environment/un-sounds-clarion-call-over-irreversible-climate-impacts-by-humans-2021-08-09/.
[205] John Fleming et al., "FLIGHT PATH a Trajectory for U.S. Aviation to Meet Global Climate Goals CENTER for BIOLOGICAL DIVERSITY • OCTOBER 2020," www.biologicaldiversity.com (Center for Biological Diversity, October 2020), https://www.biologicaldiversity.org/programs/climate_law_institute/pdfs/Flight-Path-A-Trajectory-for-U-S-Aviation-to-Meet-Global-Climate-Goals.pdf.

from 1990 levels. This ruling puts jet fuel taxes in line with other transportation sectors, and will be phased in over 10 years. The EU is strict about this regulation, even requiring foreign airlines to pay these taxes for flights that traverse their airspace.[206] The ruling also requires fuel suppliers to have a minimum of 2 percent SAF fuel by 2025, 5 percent by 2030, and 63 percent by 2050. Further, there are stricter restrictions placed on "tankering," the practice of flying in on return flights with cheaper fuel from elsewhere. Additionally, free carbon dioxide permits are being phased out by 2026 to force airlines to pay for their impact on the planet.[207] The US could adopt similar mandates for taxes on carbon emissions and reduction goals to make the effect of emitting greenhouse gases visible to companies. Requiring financial compensation for the lack of decarbonization could be a powerful incentive for airlines to redirect their investments toward cleaner energy and aircraft technology.

***Criticism***

Airlines for Europe has argued that these fuel tax mandates threaten airline competitiveness and the tourism industry because increased costs that airlines will have to pay for emissions could be passed to consumers, potentially decreasing business. But environmental groups say that higher taxes should be imposed.[208]

***Increasing Fuel Efficiency***

In October 2020, the Center for Biological Diversity published a possible trajectory for the US aviation industry to meet global climate change goals. A main strategy is pushing for an annual increase in fuel efficiency of at least 3.5 percent. This would lead to a reduction in emissions by 32 percent as compared to business as usual by 2040.[209] At the current rate that aircraft technology is improving, gains in fuel efficiency will lead to at most 20 to 30 percent reduction in emissions, which

[206] Kate Abnett and Tim Hepher, "EU Targets Airlines in Major Climate Policy Shakeup," Reuters, July 14, 2021, https://www.reuters.com/business/aerospace-defense/eu-climate-blueprint-pressures-airlines-cut-emissions-2021-07-14/.
[207] "Ibid."
[208] "Ibid."
[209] John Fleming et al., "FLIGHT PATH a Trajectory for U.S. Aviation to Meet Global Climate Goals CENTER for BIOLOGICAL DIVERSITY • OCTOBER 2020," www.biologicaldiversity.com (Center for Biological Diversity, October 2020), https://www.biologicaldiversity.org/programs/climate_law_institute/pdfs/Flight-Path-A-Trajectory-for-U-S-Aviation-to-Meet-Global-Climate-Goals.pdf.

is not adequate.[210] Three ways that fuel efficiency could be improved to meet a minimum 3.5 percent annual increase are replacing older aircraft with newer, more efficient ones, improving passenger capacities and numbers of direct flights, and finding more optimal flight paths that consume less fuel.[211] Streamlining air traffic and reducing zigzag flight patterns would decrease fuel waste, but instituting this requires a joint effort from the government, regulators, and stakeholders, which slows down the process dramatically.[212]

### *Electrifying Flights*

The Center for Biological Diversity has also proposed electrifying flights to divert away from conventional jet fuel. Short-haul (less than 810 nautical miles) and medium-haul flights (between 810 and 2160 nautical miles) each make up roughly a third of global flights. A 2018 study found that fully electrified aircraft could feasibly cover up to 1200 nautical miles, which include over 80 percent of global flights. This could lead to a 40 percent reduction in greenhouse emissions from fossil fuel use to power aircraft.[213] Today's batteries are currently able to cover up to 432 nautical miles, which includes 45 percent of flights, and would still be a significant improvement from current emissions levels. Based on advances in batteries, as electrified aircraft need batteries with energy densities of about 800-2000 Watt hours per kilogram, fully electrified short-haul flights should be feasible by 2040.[214] Efforts in Europe to test electrified small flights have been promising. Norway expects to have all short-haul flights electrified by 2040.

---

[210] Alex Dichter et al., "How Airlines Can Chart a Path to Zero-Carbon Flying | McKinsey," McKinsey & Company, May 13, 2020, https://www.mckinsey.com/industries/travel-logistics-and-infrastructure/our-insights/how-airlines-can-chart-a-path-to-zero-carbon-flying#.
[211] John Fleming et al., "FLIGHT PATH a Trajectory for U.S. Aviation to Meet Global Climate Goals CENTER for BIOLOGICAL DIVERSITY • OCTOBER 2020," www.biologicaldiversity.com (Center for Biological Diversity, October 2020), https://www.biologicaldiversity.org/programs/climate_law_institute/pdfs/Flight-Path-A-Trajectory-for-U-S-Aviation-to-Meet-Global-Climate-Goals.pdf.
[212] Alex Dichter et al., "How Airlines Can Chart a Path to Zero-Carbon Flying | McKinsey," McKinsey & Company, May 13, 2020, https://www.mckinsey.com/industries/travel-logistics-and-infrastructure/our-insights/how-airlines-can-chart-a-path-to-zero-carbon-flying#.
[213] John Fleming et al., "FLIGHT PATH a Trajectory for U.S. Aviation to Meet Global Climate Goals CENTER for BIOLOGICAL DIVERSITY • OCTOBER 2020," www.biologicaldiversity.com (Center for Biological Diversity, October 2020), https://www.biologicaldiversity.org/programs/climate_law_institute/pdfs/Flight-Path-A-Trajectory-for-U-S-Aviation-to-Meet-Global-Climate-Goals.pdf.
[214] "Ibid."

For long-haul flights, full electrification would be difficult given battery technology, but hybrid-electric or turboelectric power is promising. The Boeing Sugar Volt hybrid-electric concept could theoretically cover 3500 nautical miles, leading to a 60 to 70 percent reduction in fuel usage. According to the Center for Biological Diversity, electrified flights could be tested in the US by 2025 and used for the first time by 2035 if resources are allocated towards their development.[215] Resources should also go towards developing lighter aircraft that can carry more passengers to further decrease the energy demands of long-haul flights.[216]

***Alternative Fuels and Power Sources***

Switching to alternative fuels that are low-carbon or carbon-neutral to power aircraft is pertinent. Both airlines and renewables companies have been lobbying the Biden administration to increase subsidies on low-carbon fuel to incentivize climate change-conscious practices.[217] Sustainable aviation fuel (SAF) is three to four times more expensive than conventional fuel, and Airlines for America claims government financial support is necessary for it to be affordable to airlines. There is an existing $1 per gallon subsidy for biofuels, but the National Air Transportation Association made a proposal for the incentive to increase to up to $2 per gallon.[218]

In addition to being more expensive, older aircraft need to be replaced with ones that are compatible with running on higher percentages of SAF. Boeing has committed to being 100 percent SAF run by 2030, but airlines need to buy the aircraft, and may delay replacing their fleets without government subsidies.[219]

[215] "Ibid."
[216] Anmar Frangoul, "Hydrogen Planes, Electric Propulsion and New Regulations: Aviation Is Changing," CNBC, June 15, 2021, https://www.cnbc.com/2021/06/15/hydrogen-planes-electric-propulsion-aviation-is-changing-.html.
[217] Stephanie Kelly, "Airlines, Renewables Companies Push Biden to Make Air Travel Greener," Reuters, February 19, 2021, https://www.reuters.com/article/us-usa-energy-aviation/airlines-renewables-companies-push-biden-to-make-air-travel-greener-idUSKBN2AJoLH.
[218] "Ibid."
[219] "Ibid."

### *Biofuels*

Biofuels are a viable, immediately available alternative to conventional jet fuel. However, biofuels are not a long-term solution to reaching carbon neutral aviation. Biofuel is made from vegetable and waste oils or livestock waste, but is labor intensive on farmland and has a high cost of production, collection, and transportation.[220]

### *Hydrogen Power*

Hydrogen power is a clean option for sustainable fuel, but is highly expensive and not competitive with other fuel options presently available. The only waste product is clean water, and hydrogen power is highly efficient with a high energy produced per unit of mass. Investing in the future of hydrogen power is appealing, as it is three times as efficient as jet fuel and over 100 times more efficient than batteries. The largest hurdle for hydrogen power is its cost.[221]

### *Carbon Offsetting*

Carbon offsetting is the business practice of investing in global environmental projects to compensate for the cost of the emissions on the planet, such as planting trees. However, carbon offsetting is criticized as a form of greenwashing, or performative action that makes a company look more environmentally conscious to its customers but does not lead to any substantial reduction in emissions. Businesses may feel legitimized to keep polluting the air as long as they pay to "offset" the damages, whereas they should have been working on ways to reduce their emissions in the first place. Offsetting absolves businesses of responsibility for environmental harm. It is also important to note that offsetting is usually much cheaper than, for example, developing energy-efficient technologies, so offsetting is seen by some as an easier option to get away with carbon emission

[220] Alex Dichter et al., "How Airlines Can Chart a Path to Zero-Carbon Flying | McKinsey," McKinsey & Company, May 13, 2020, https://www.mckinsey.com/industries/travel-logistics-and-infrastructure/our-insights/how-airlines-can-chart-a-path-to-zero-carbon-flying#.
[221] Caspar Henderson, "The Hydrogen Revolution in the Skies," BBC, April 8, 2021, https://www.bbc.com/future/article/20210401-the-worlds-first-commercial-hydrogen-plane.

standards.[222] This practice is also criticized for shifting the burden of reducing carbon emissions to poorer countries, since many of the offset projects are physically located there instead of in the industrialized ones.[223] Further, some offset schemes are found to have violated human rights and caused land destruction, which is not accounted for later.[224] Overall, public opinion looks unfavorably upon carbon offsetting as a primary method for reducing the impact of aviation emissions.

[222] John Fleming et al., "FLIGHT PATH a Trajectory for U.S. Aviation to Meet Global Climate Goals CENTER for BIOLOGICAL DIVERSITY • OCTOBER 2020," www.biologicaldiversity.com (Center for Biological Diversity, October 2020), https://www.biologicaldiversity.org/programs/climate_law_institute/pdfs/Flight-Path-A-Trajectory-for-U-S-Aviation-to-Meet-Global-Climate-Goals.pdf.
[223] Alex Dichter et al., "How Airlines Can Chart a Path to Zero-Carbon Flying | McKinsey," McKinsey & Company, May 13, 2020, https://www.mckinsey.com/industries/travel-logistics-and-infrastructure/our-insights/how-airlines-can-chart-a-path-to-zero-carbon-flying#.
[224] John Fleming et al., "FLIGHT PATH a Trajectory for U.S. Aviation to Meet Global Climate Goals CENTER for BIOLOGICAL DIVERSITY • OCTOBER 2020," www.biologicaldiversity.com (Center for Biological Diversity, October 2020), https://www.biologicaldiversity.org/programs/climate_law_institute/pdfs/Flight-Path-A-Trajectory-for-U-S-Aviation-to-Meet-Global-Climate-Goals.pdf.

# Bloc Positions

***Support for Increased Regulations***

Several parties will be unwavering in their support of strict emissions regulations in favor of environmental health. This group includes the EPA administrator, environmental lobbyists, and lobbyists representing the interests of the steel industry, public transportation, and high-speed rail. The EPA works readily to make recommendations on aviation emissions regulation with the expectation of anticipating DOT's implementation, so the EPA administrator would be heavily in support of increased regulations and less willing to compromise on solutions that don't maximize environmental protection. Along with the EPA, lobbyists from environment-focused organizations including Earthjustice, the Sunrise Movement, and the Sierra Club would strongly support increased regulations as well and would likely not be satisfied with non-aggressive environmental policies. The steel industry lobbyist would also likely support increased regulations as airlines would need to replace non-compliant aircraft with compliant ones to maintain their fleets, creating an increased demand for steel. Lobbyists from the High Speed Rail Association and the American Public Transportation Association would also favor regulation, as increased regulations would likely lead to higher plane ticket prices due to rising costs for airlines. This could lead to more public support for alternatives to flying, including rail transportation. Industry leaders from rail companies would align similarly with pro-rail lobbyists in favor of increased aviation emissions regulations for the potential of increased rail passengers and therefore increased revenues.

***Mixed Support/Ambivalence***

Most Department of Transportation administrators will generally be in support of increasing regulations on aviation emissions but with some ambivalence. In April 2021, the DOT published a statement that it would "[move] aggressively to respond to President Biden's January 20 executive order on Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis."[225] This action is aligned with the DOT's "important fuel economy, equity, and climate change

[225] Department of Transportation, "NHTSA Advances Biden-Harris Administration's Climate & Jobs Goals | US Department of Transportation," US DOT, April 22, 2021, https://www.transportation.gov/briefing-room/nhtsa-advances-biden-harris-administrations-climate-jobs-goals.

priorities."[226] The ruling removes previous barriers to implementing greenhouse gas regulations in the transportation sector. Additionally, Secretary of Transportation Pete Buttigieg acknowledged that "[the] transportation sector is the biggest contributor to greenhouse gases in our economy– which means it can and must be a big part of the climate solution."[227] The current DOT administration under Secretary Buttigieg's authority would overall be in favor of environmentally-conscious aviation emissions policies. However, the DOT also has goals to boost "economic productivity and global competitiveness,"[228] so administrators might be more lenient towards the demands of aviation industry leaders to minimize losses in revenue due to these conflicting interests.

Labor union lobbyists would also have ambivalence towards increased aviation emissions regulations. The goals of labor unions are multifaceted in that they focus on protecting the health and safety of workers as well as ensuring job and income security. Increased emissions regulations would promote the physical health of workers, as it would result in decreased exposure to air pollution from aircraft and the adverse health effects that come with exposure. However, stricter regulations may increase costs for airlines, most notably in the replacement for regulation-compliant aircraft and fuel. This could lead to layoffs—an appealing option for cost containment. Labor union lobbyists must carefully consider the specific ripple effects of different solutions to decide how they will lend their support.

***Resistance to Regulation***

Airline industry leaders would be against increased aviation emissions regulations. Increased regulations would require restructuring of their business practices. This would lead to increased costs and possibly fewer customers. As a result, overall revenues would drop. Heavier government involvement would also impede the efficiency of business operations, which is contrary to the free-market principle that strives to maximize profits through high efficiency and low costs. Lobbyists from Koch Institute and Airlines for America would also be against regulation as the Koch Institute

[226] "Ibid."
[227] "Ibid."
[228] "About DOT | US Department of Transportation," Transportation.gov, 2019, https://www.transportation.gov/about.

actively campaigns against climate change solutions[229] and Airlines for America acts to represent the interests of airlines.[230]

[229] Greenpeace, "Koch Industries: Secretly Funding the Climate Denial Machine," Greenpeace USA, n.d., https://www.greenpeace.org/usa/ending-the-climate-crisis/climate-deniers/koch-industries/.
[230] Airlines for America (A4A), "About A4A," Airlines For America, n.d., https://www.airlines.org/who-we-are/.

# Glossary

**Carbon Offsetting:** the business practice of investing in global environmental projects to compensate for the cost of the emissions on the planet, such as planting trees.[231]

**Free Market:** also known as "laissez-faire capitalism," it is the economic system in which prices are determined by unregulated or minimal government-regulated competition between businesses in the same market.[232]

**Government Bailout:** when the government provides financial support to a business that is in trouble to prevent bankruptcy.[233]

**Greenwashing:** when a company focuses on creating an environmentally-conscious image to their customers but does not actually effectively combat its negative impact on the environment through its business practices.[234]

**Oligopoly:** when a market is dominated by a few companies that influence each other's business decisions and work together to artificially inflate prices.[235]

**Subsidy:** when the government gives benefits to an industry through tax breaks or money payments to help offset costs.[236]

**Tankering:** the practice of flying in on return flights with cheaper fuel from elsewhere.[237]

---

[231] Alex Dichter et al., "How Airlines Can Chart a Path to Zero-Carbon Flying | McKinsey," McKinsey & Company, May 13, 2020, https://www.mckinsey.com/industries/travel-logistics-and-infrastructure/our-insights/how-airlines-can-chart-a-path-to-zero-carbon-flying#.

[232] Jim Chappelow, "Free Market Definition," Investopedia, April 28, 2020, https://www.investopedia.com/terms/f/freemarket.asp.

[233] Wex Definitions Team, "Bailout," Cornell Law School Legal Information Institute, accessed August 14, 2021, https://www.law.cornell.edu/wex/bailout#:~:text=A%20bailout%20is%20when%20the.

[234] Alex Dichter et al., "How Airlines Can Chart a Path to Zero-Carbon Flying | McKinsey," McKinsey & Company, May 13, 2020, https://www.mckinsey.com/industries/travel-logistics-and-infrastructure/our-insights/how-airlines-can-chart-a-path-to-zero-carbon-flying#.

[235] Jim Chappelow, "Oligopoly," Investopedia, March 29, 2019, https://www.investopedia.com/terms/o/oligopoly.asp.

[236] Gordon Scott, "Subsidy," Investopedia, 2019, https://www.investopedia.com/terms/s/subsidy.asp.

[237] Kate Abnett and Tim Hepher, "EU Targets Airlines in Major Climate Policy Shakeup," Reuters, July 14, 2021, https://www.reuters.com/business/aerospace-defense/eu-climate-blueprint-pressures-airlines-cut-emissions-2021-07-14/.

# Bibliography


Abnett, Kate, and Tim Hepher. "EU Targets Airlines in Major Climate Policy Shakeup." Reuters, July 14, 2021. https://www.reuters.com/business/aerospace-defense/eu-climate-blueprint-pressures-airlines-cut-emissions-2021-07-14/.

Ahn, Sungjoo. "EPA's New Aviation Emissions Standard: Why It's Already Obsolete - Environmental & Energy Law Program." Harvard Law School, February 25, 2021. https://eelp.law.harvard.edu/2021/02/epas-aviation-emissions-standard/.

Airlines for America. "About A4A." Airlines For America, n.d. https://www.airlines.org/who-we-are/.

Aviation Oil Outlet. "The Early History of Commercial Air Travel." Aviation Oil Outlet, May 3, 2017. https://aviationoiloutlet.com/blog/early-history-commercial-air-travel/.

Center for Biological Diversity. "Lawsuit Challenges Obama Administration's Failure to Curb Airplane Carbon Pollution." www.biologicaldiversity.org, April 12, 2016. https://www.biologicaldiversity.org/news/press_releases/2016/airplane-emissions-04-12-2016.html.

Center for Biological Diversity. "Trump Administration Finalizes Do-Nothing 'Standards' for Airplane Climate Emissions." Center for Biological Diversity, December 28, 2020. https://biologicaldiversity.org/w/news/press-releases/trump-administration-finalizes-do-nothing-standards-for-airplane-climate-emissions-2020-12-28/.

Chappelow, Jim. "Free Market Definition." Investopedia, April 28, 2020. https://www.investopedia.com/terms/f/freemarket.asp.

Chappelow, Jim. "Oligopoly." Investopedia, March 29, 2019. https://www.investopedia.com/terms/o/oligopoly.asp.

Dempsey, Joshua, Wendy Beckman, and Ronald Ferrara. "The Impact of Government Policy on Airline Profitability." December 2013. https://jewlscholar.mtsu.edu/bitstream/handle/mtsu/3604/Dempsey_mtsu_0170N_10188.pdf?sequence=1&isAllowed=y.

Department of Transportation. "NHTSA Advances Biden-Harris Administration's Climate & Jobs Goals | US Department of Transportation." US DOT, April 22, 2021. https://www.transportation.gov/briefing-room/nhtsa-advances-biden-harris-administrations-climate-jobs-goals.

Dichter, Alex, Kimberly Henderson, Robin Riedel, and David Riefer. "How Airlines Can Chart a Path to Zero-Carbon Flying | McKinsey." McKinsey & Company, May 13, 2020. https://www.mckinsey.com/industries/travel-logistics-and-infrastructure/our-insights/how-airlines-can-chart-a-path-to-zero-carbon-flying#.

Environmental Protection Agency. "Final Rule for Finding That Greenhouse Gas Emissions from Aircraft Cause or Contribute to Air Pollution That May Reasonably Be Anticipated to Endanger Public Health and Welfare | US EPA." US EPA, n.d. https://www.epa.gov/regulations-emissions-vehicles-and-engines/final-rule-finding-greenhouse-gas-emissions-aircraft.

Environmental Protection Agency. "Summary of the Clean Air Act | US EPA." US EPA, August 15, 2018. https://www.epa.gov/laws-regulations/summary-clean-air-act.

Federal Aviation Administration. "A Brief History of the FAA." Faa.gov, 2017. https://www.faa.gov/about/history/brief_history/.

Federal Aviation Administration. "Chapter 5: An Evolving Agency in a Changing World." In *FAA: A Historical Perspective, 1903-2008*, 52–58, n.d. https://www.faa.gov/about/history/historical_perspective/media/historical_perspective_ch5.pdf.

Federal Aviation Administration. "Press Release – FAA Statement on EPA Airplane Greenhouse Gas Emissions Rule." www.faa.gov, December 28, 2020. https://www.faa.gov/news/press_releases/news_story.cfm?newsId=25540&omniRss=press_releasesAoc&cid=102_P_R.

Fleming, John, Ben Goloff, Liz Jones, Claire Lakewood, Nyshie Perkinson, Kassie Segel, Patrick Sullivan, and Shayne Wolf. "FLIGHT PATH a Trajectory for U.S. Aviation to Meet Global Climate Goals CENTER for BIOLOGICAL DIVERSITY • OCTOBER 2020." www.biologicaldiversity.com. Center for Biological Diversity, October 2020. https://www.biologicaldiversity.org/programs/climate_law_institute/pdfs/Flight-Path-A-Trajectory-for-U-S-Aviation-to-Meet-Global-Climate-Goals.pdf.

Frangoul, Anmar. "Hydrogen Planes, Electric Propulsion and New Regulations: Aviation Is Changing." CNBC, June 15, 2021. https://www.cnbc.com/2021/06/15/hydrogen-planes-electric-propulsion-aviation-is-changing-.html.

Goldenberg, Suzanne. "Obama Fails First Climate Test by Rejecting EU Aviation Carbon Regime." The Guardian, November 28, 2012. https://www.theguardian.com/world/2012/nov/28/obama-fails-climate-test-aviation.

Greenpeace. "Koch Industries: Secretly Funding the Climate Denial Machine." Greenpeace USA, n.d. https://www.greenpeace.org/usa/ending-the-climate-crisis/climate-deniers/koch-industries/.

Hasbrouck, Edward. "The Biden Administration Wants to 'Build Back Better'—What Could That Mean for Air Travel?" Sierra Club, June 25, 2021. https://www.sierraclub.org/sierra/biden-administration-wants-build-back-better-what-could-mean-for-air-travel.

Henderson, Caspar. "The Hydrogen Revolution in the Skies." BBC, April 8, 2021. https://www.bbc.com/future/article/20210401-the-worlds-first-commercial-hydrogen-plane.

Hersher, Rebecca. "U.S. Officially Leaving Paris Climate Agreement." NPR.org, November 3, 2020. https://www.npr.org/2020/11/03/930312701/u-s-officially-leaving-paris-climate-agreement.

"International Civil Aviation Organization's CO2 Standard for New Aircraft." The International Council on Clean Transportation, January 2017. https://theicct.org/sites/default/files/publications/ICCT-ICAO_policy-update_revised_jan2017.pdf.

Kelly, Stephanie. "Airlines, Renewables Companies Push Biden to Make Air Travel Greener." *Reuters*, February 19, 2021. https://www.reuters.com/article/us-usa-energy-aviation/airlines-renewables-companies-push-biden-to-make-air-travel-greener-idUSKBN2AJ0LH.

Koenig, David. "Airline CEOs, Biden Officials Consider Green-Fuel Breaks." AP NEWS, April 20, 2021. https://apnews.com/article/scott-kirby-climate-climate-change-airlines-pete-buttigieg-6bed112b680f66762efe9a6ebf476c31.

Lampert, Allison, and Stephanie Kelly. "EXCLUSIVE U.S. Weighs 2050 Target in Bid to Wean Airlines off Fossil Fuels." Reuters, August 10, 2021. https://www.reuters.com/business/aerospace-defense/exclusive-us-weighs-2050-target-bid-wean-airlines-off-fossil-fuels-2021-08-10/.

Lee, David S., and Piers Forster. "Guest Post: Calculating the True Climate Impact of Aviation Emissions." Carbon Brief, September 21, 2020. https://www.carbonbrief.org/guest-post-calculating-the-true-climate-impact-of-aviation-emissions.

Lowry, Joan. "Obama Administration Proposes Regulation of Aircraft Emissions." PBS, June 10, 2015. https://www.pbs.org/newshour/nation/obama-administration-proposes-regulation-aircraft-emissions.

McGrath, Matt. "Climate Change: US Formally Withdraws from Paris Agreement." *BBC News*, November 4, 2020, sec. Science & Environment. https://www.bbc.com/news/science-environment-54797743#:~:text=After%20a%20three%2Dyear%20delay.

Overton, Jeff. "Fact Sheet: The Growth in Greenhouse Gas Emissions from Commercial Aviation | White Papers | EESI." Environmental and Energy Study Institute (EESI). October 17, 2019. https://www.eesi.org/papers/view/fact-sheet-the-growth-in-greenhouse-gas-emissions-from-commercial-aviation.

Oxner, Reese. "U.S. Implementing 1st-Ever Airplane Emission Rules; Critics Say They're Ineffective." NPR.org, December 28, 2020. https://www.npr.org/2020/12/28/950863508/u-s-implementing-1st-ever-airplane-emission-rules-critics-say-theyre-ineffective.

Peterson, Robert. "Impacts of Airline Deregulation." TR News, June 2018. http://onlinepubs.trb.org/onlinepubs/trnews/trnews315airlinedereg.pdf.

Petsonk, Annie. "Trump EPA: Idling on Aviation Pollution." Environmental Defense Fund, December 28, 2020. https://www.edf.org/media/trump-epa-idling-aviation-pollution.

Quadros, Flávio D A, Mirjam Snellen, and Irene C Dedoussi. "Regional Sensitivities of Air Quality and Human Health Impacts to Aviation Emissions." *Environmental Research Letters* 15, no. 10 (October 7, 2020): 105013. https://doi.org/10.1088/1748-9326/abb2c5.

"Reducing Carbon Dioxide Emissions from Aircraft." Center for Climate and Energy Solutions, July 22, 2020. https://www.c2es.org/content/reducing-carbon-dioxide-emissions-from-aircraft/.

Rott, Nathan. "Biden Moves to Have U.S. Rejoin Climate Accord." NPR.org, January 20, 2021. https://www.npr.org/sections/inauguration-day-live-updates/2021/01/20/958923821/biden-moves-to-have-u-s-rejoin-climate-accord.

Russell, Edward. "Biden Transportation Department Zeros in on Aviation Emissions in Climate Push." Airline Weekly, March 5, 2021. https://airlineweekly.com/2021/03/biden-transportation-department-zeros-in-on-aviation-emissions-in-climate-push/.

Scott, Gordon. "Subsidy." Investopedia, 2019. https://www.investopedia.com/terms/s/subsidy.asp.

Tigue, Kristoffer, and Marianne Lavelle. "Draft Airline Emission Rules Are the Latest Trump Administration Effort to Change Its Climate Record." Inside Climate News, July 23, 2020. https://insideclimatenews.org/news/23072020/airlines-epa-andrew-wheeler-greenhouse-gas-emissions-trump/.

Timperley, Jocelyn. "'No Time for Requirements': Aviation Industry Lobbying against Green Strings in Coronavirus Bailouts." DeSmog, April 3, 2020. https://www.desmog.com/2020/04/03/no-time-requirements-aviation-industry-lobbying-against-coronavirus-bailout-green-strings/.

United Nations Climate Change. "What Is the Kyoto Protocol? | UNFCCC." Unfccc.int. UNFCCC, 2019. https://unfccc.int/kyoto_protocol.

United Nations Framework Convention on Climate Change. "The Paris Agreement." UNFCCC. United Nations, 2016. https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement.

Webb, Sandy. "Aviation Emissions, Impacts & Mitigation: A Primer, January 2015." . US FAA, 2015. https://www.faa.gov/regulations_policies/policy_guidance/envir_policy/media/Primer_Jan2015.pdf.

Wex Definitions Team. "Bailout." Cornell Law School Legal Information Institute. Accessed August 14, 2021. https://www.law.cornell.edu/wex/bailout#:~:text=A%20bailout%20is%20when%20the.