

The Environmental Impact Of Different Forms Of Transportation

By Prisha Bhella and Shruthi Hariharan
Grade 5, Homeroom 5-1, Fairview School

2. Table of Contents

Hypothesis-Slide 3

Impact of human activity on the environment-Slide 4

What is Global Warming-Slide 5

US Emissions Data-Slide 6

Global Greenhouse gas emissions by economic sector-Slide 7

The carbon footprint of different modes of travel-Slide 8

Comparing different forms of transportation for overall environmental impact-Slide 9

Global CO₂ emissions from transport sector-Slide 10

U.S. and Canadian Data-Slide 11

Future Considerations-Slide 12

Conclusions-Slide 13

Bibliography-Slide 14

3. Hypothesis

Cars make the most pollution per year because there are so many of them.



4. Impact of human activity on the environment



Nov 2019 (pre-
COVID)

April 2020 (early
COVID)

Comparison of New Delhi skyline before and after COVID showing impact of human pollution on air quality. During COVID, there were less cars on the road and less factories open.

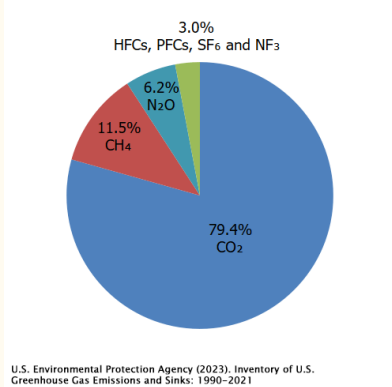
5. What is Global Warming?

Word Facts! What is chlorofluorocarbons?

Chlorofluorocarbons are nontoxic, non flammable chemicals containing atoms of carbon, chlorine, and fluorine.

Word Facts! What is nitrous oxide?

Nitrous oxide is an anesthetic, used for many different medical purposes.



<https://www.epa.gov/ghgemissions/overview-greenhouse-gases>

What is Global Warming?

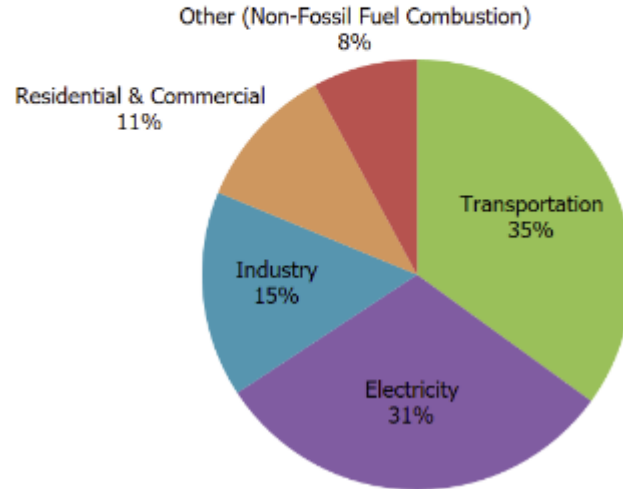
Global warming is the earth's temperature rising. Global warming disrupts the usual balance of nature. This affects all living things. One of the main things causing global warming are greenhouse gases. They play a big role in heating up the earth. Human actions also contribute to global warming, such as cutting down forests, manufacturing/factories and generating electricity and heat by burning fossil fuels. The main greenhouse gases that cause global warming are carbon dioxide, chlorofluorocarbons, water vapor, methane and nitrous oxide. Carbon dioxide take up the largest amount of greenhouse gases.

Cars and vehicles contribute to global warming because they use gas/ fossil fuel for combustion which releases toxic gases like carbon dioxide and carbon monoxide.

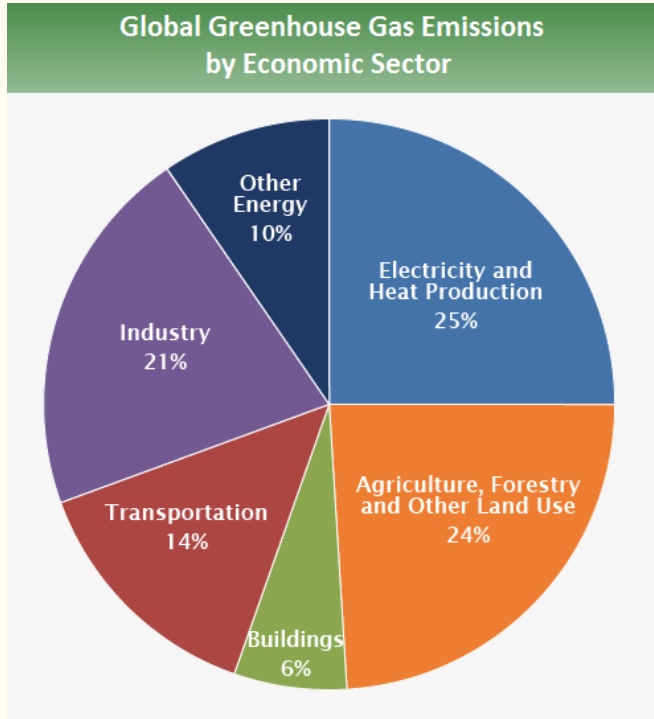
6. US Emissions Data

Here is a chart of U.S. Carbon Dioxide Emissions by Economic Sector. As you can see, Transportation takes up the largest portion of the chart and produces the most carbon emissions.

U.S. Carbon Dioxide Emissions, by Economic Sector

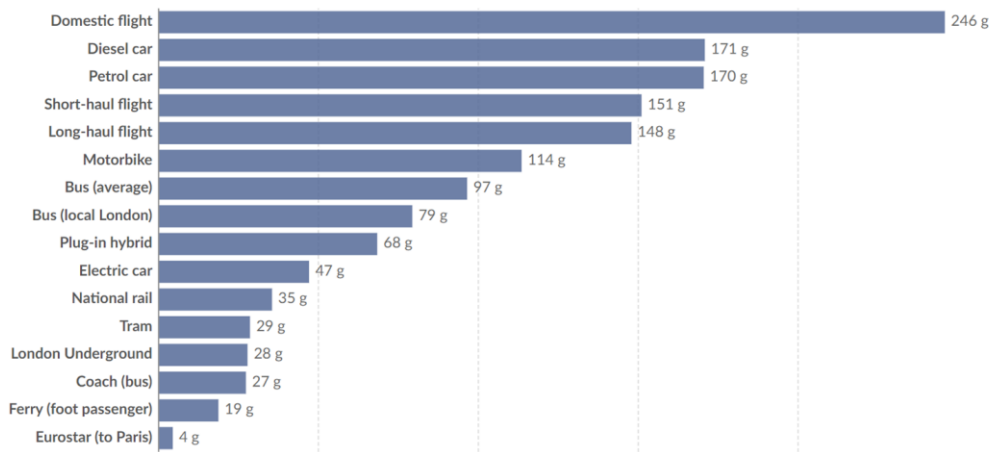


7. Global greenhouse gas emissions by economic sector



This 2010 data shows a breakdown of greenhouse gas production by each economic sector on a global level. Transportation at a global level is approximately 1/7 of all greenhouse gas emissions.

8. The carbon footprint of different modes of travel

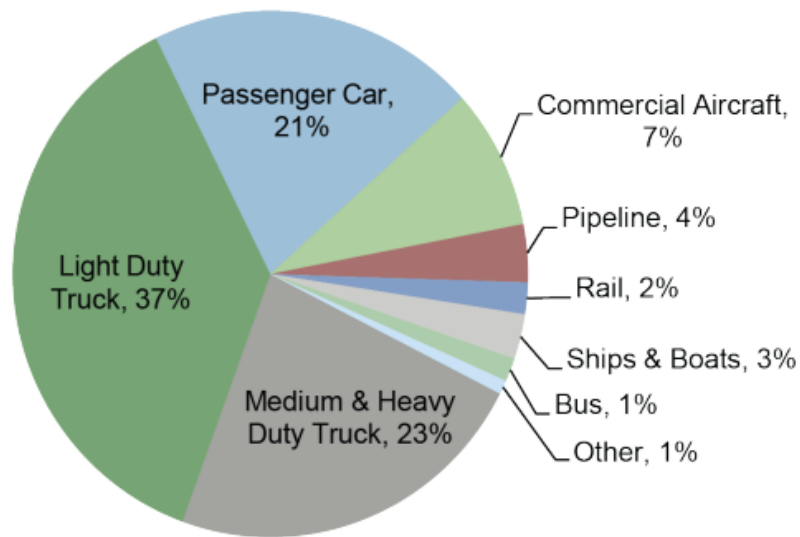


This chart based on data from the UK government shows the carbon footprint associated with different types of travel as measures in grams of carbon dioxide equivalents per passenger kilometer. Domestic flights followed by fuel using cars have the highest carbon footprint on an individual level.

CO2 emissions of transport modes (UK Government) – processed by Our World in Data. “Transport emissions per kilometer travelled” [dataset]. CO2 emissions of transport modes (UK Government) [original data].

9. Comparing different forms of transportation for overall environmental impact

Transportation Greenhouse Gases, 2021⁶

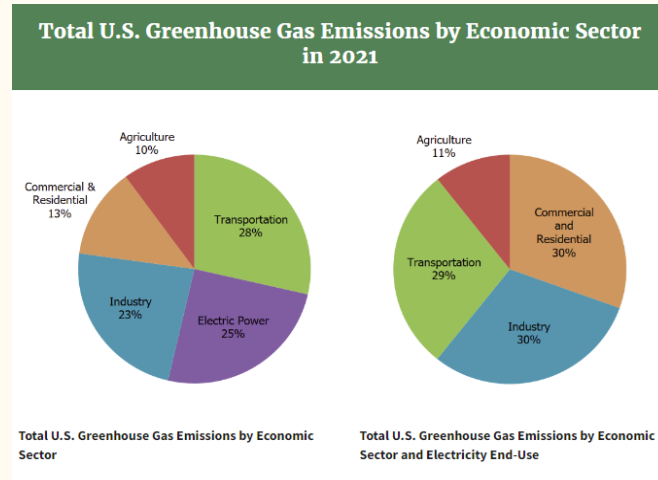
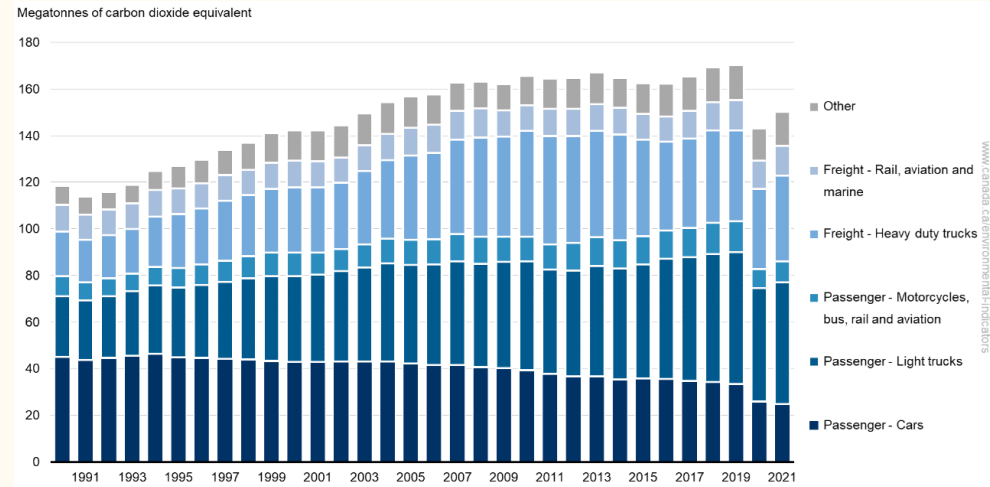


This chart from the University of Michigan shows a comparison of different forms of transportation. Light duty trucks contribute the most greenhouse gases out of any of the forms of transportation listed.

10. U.S. and Canadian Data

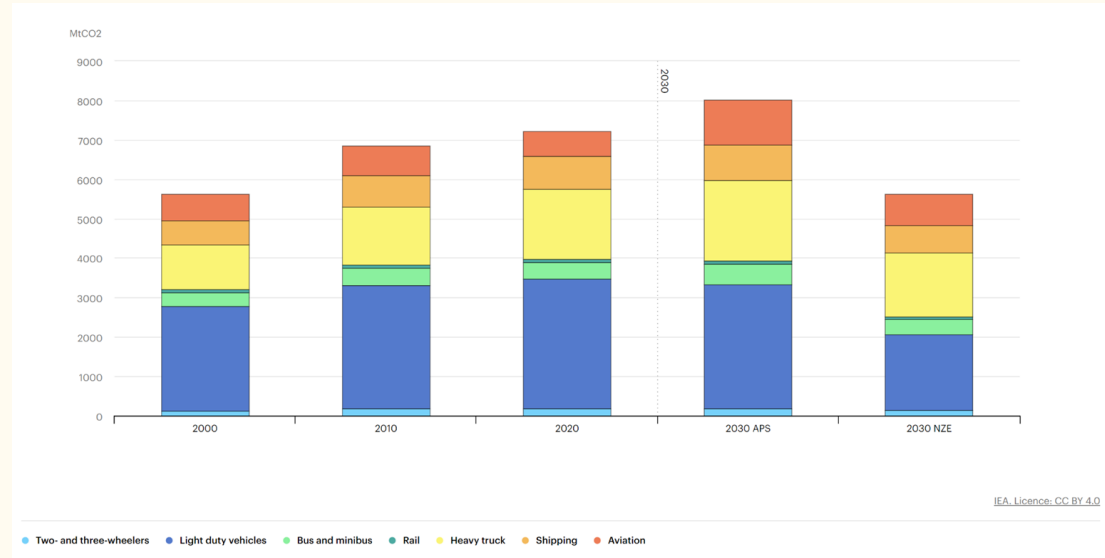
The transport sector was the second largest emitter (22%) of greenhouse gases in Canada in 2021, with oil and gas sector being the first largest (28%). The figure shows increasing greenhouse gas emissions from the transport sector between 1990 to 2021 due to increase in number of vehicles on the road. Similar to US, emissions from light trucks have nearly doubled, while the emissions from cars have declined by 45%.

In the bottom right chart, you can see the total U.S. Greenhouse Gas Emissions in 2021. The largest amount (28%) of Greenhouse Gas Emissions come from transportation by the economic sector. (As shown on the chart on the bottom left.)



11. Global CO₂ emissions from transport sector

This is a chart showing the carbon dioxide emissions from the transport sector around the world. Light blue is two and three wheelers, dark blue is light duty vehicles, light green is bus and minibus, dark green is rail, yellow is heavy truck, orange is shipping, and red is aviation. After 2020 is a prediction for the future. Worldwide, light duty vehicles produce the most emissions.



<https://www.iea.org/data-and-statistics/charts/global-co2-emissions-from-transport-by-subsector-2000-2030>

12. Future Considerations

Space Tourism



- although a small contributor from a carbon footprint currently, there is potential for the impact of rocket launches to increase as space tourism becomes more common, in 2022 there were 180 launches to orbit
- the soot (formally known as black carbon) produced by rockets are nearly 500 times more able to warm the atmosphere compared to all other sources of soot combined (such as jets, ships, coal plants and diesel trucks)
- at the higher altitudes that rockets travel, soot can persist for years as opposed to just weeks for jets that release it into the lower atmosphere
- it is believed that increased space tourism may also reverse improvements in the ozone layer

<https://agupubs.onlinelibrary.wiley.com/doi/10.1029/2021EF002612>

<https://newsinteractives.cbc.ca/features/2023/rocket-pollution/>

13. Conclusions

Transportation is one of the biggest sectors overall, but if you observe the charts, you can see that worldwide, light duty vehicles create the most emissions. This includes cars and light duty trucks. Light duty trucks are the largest emitter of pollution in Canada and U.S.A. Our hypothesis was partially correct because light duty vehicles (which include cars) are the biggest polluter, but not specifically cars.



Bibliography

- [Cities around the world have seen air pollution plummet during COVID-19. Is this the beginning of Toronto's green revolution?](#)
- <https://www.epa.gov/ghgemissions/overview-greenhouse-gases>
- [Overview of Greenhouse Gases | US EPA](#)
- <https://www.epa.gov/ghgemissions/global-greenhouse-gas-emissions-data>
- CO2 emissions of transport modes (UK Government) – processed by Our World in Data. “Transport emissions per kilometer travelled” [dataset]. CO2 emissions of transport modes (UK Government) [original data].
- <https://www.iea.org/data-and-statistics/charts/global-co2-emissions-from-transport-by-subsector-2000-2030>
- <https://agupubs.onlinelibrary.wiley.com/doi/10.1029/2021EF002612>
- <https://newsinteractives.cbc.ca/features/2023/rocket-pollution/>