## Committee: Environment

## Topic: The question of global transportation emissions

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## Summary

The issue of global transport emissions is a critical challenge in the fight against climate change. Transportation is a significant contributor to greenhouse gas (GHG) emissions, accounting for around 24% of global CO2 emissions from fuel combustion. These emissions contribute to global warming, which has severe environmental, economic, and social impacts. Addressing transport emissions requires coordinated efforts from countries, international organizations, and the private sector. This report delves into the complexities of global transport emissions, examining the major contributors, the impact of existing treaties and regulations, and potential solutions to reduce the environmental footprint of transportation.

## Definition of Key Terms

**Greenhouse Gases (GHG):** Gases that trap heat in the atmosphere, contributing to the greenhouse effect and global warming. Key GHGs include carbon dioxide (CO2), methane (CH4), nitrous oxide (N2O), and fluorinated gases.

**Carbon Footprint:** The total amount of greenhouse gases emitted by an individual, organization, or product, usually measured in equivalent tons of CO2.

**Sustainable Transport:** Transportation that is environmentally friendly, economically viable, and socially acceptable, minimizing negative impacts on the environment and society.

**Modal Shift:** The process of changing the mode of transport, usually from a more polluting to a less polluting one, such as from cars to public transportation, cycling, or walking.

**Electric Vehicles (EVs):** Vehicles powered by electric motors using energy stored in batteries, which produce zero tailpipe emissions.

**Fuel Efficiency:** The efficiency of a vehicle in converting fuel into energy to power movement, usually measured in miles per gallon (mpg) or litres per 100 kilometres (L/100 km).

**Intermodal Transport:** The use of more than one mode of transportation in a single journey, such as combining rail and truck transport to move goods.

**Decarbonization:** The process of reducing carbon dioxide emissions associated with human activities, particularly in the energy and transport sectors.

## Background Information

**The Role of Transport in Global Emissions:** Transportation is a crucial sector in the global economy, enabling the movement of people and goods. However, it is also a major source of GHG emissions, particularly CO2. The International Energy Agency (IEA) estimates that the transport sector accounted for approximately 24% of global CO2 emissions from fuel combustion in 2020. This makes it the second-largest emitter after the energy sector.

**Types of Transport Emissions:**

1. **Road Transport:** This includes passenger vehicles, trucks, and buses. Road transport is the largest contributor to transport emissions, accounting for nearly 75% of the total.

2. **Aviation:** Both domestic and international aviation contribute significantly to CO2 emissions. Despite representing a smaller percentage of total transport emissions, aviation's impact is magnified by the high altitude at which emissions are released

3. **Maritime Transport**: Ships carry about 90% of the world’s trade, making maritime transport a significant contributor to global emissions, particularly in the form of CO2 and sulphur oxides (SOx).

4. **Rail Transport:** Rail is generally more energy-efficient and produces lower emissions compared to road and air transport, especially when powered by electricity from renewable sources.

**Impact of Transport Emissions:** The environmental impact of transport emissions is profound. CO2 is the primary greenhouse gas emitted by the transport sector, contributing to global warming and climate change. Other pollutants, such as nitrogen oxides (NOx) and particulate matter (PM), contribute to air quality degradation, leading to health problems like respiratory and cardiovascular diseases.

**Economic and Social Implications:** The economic implications of transport emissions are vast. The cost of climate change, driven by rising global temperatures, includes increased frequency of extreme weather events, loss of biodiversity, and damage to infrastructure. Socially, communities near high-traffic areas suffer from higher rates of pollution-related illnesses, and there is a growing concern about the environmental justice implications of transport emissions.

## Major Countries and Organizations Involved

**United States:** The U.S. is one of the largest emitters of CO2 from transport, with emissions driven by the extensive use of private vehicles and freight transport. The U.S. government has implemented various regulations to improve fuel efficiency and reduce emissions, though policies vary widely between administrations.

**China:** As the world's largest car market, China has significant transport emissions. The country is investing heavily in electric vehicles and public transportation to mitigate its carbon footprint.

**European Union & EU Countries:** The EU has been a leader in setting stringent emissions standards for vehicles and promoting sustainable transport initiatives. The EU's Green Deal aims to achieve climate neutrality by 2050, with significant reductions in transport emissions.

**India:** With a rapidly growing population and economy, India faces challenges in managing transport emissions. The government is focusing on promoting electric vehicles and improving public transport infrastructure.

**Japan:** Japan has a strong focus on fuel-efficient vehicles and hybrid technology. The country is also a leader in high-speed rail, which is an environmentally friendly alternative to air travel.

**International Maritime Organization (IMO):** The IMO is responsible for regulating shipping emissions. The organization has set targets to reduce CO2 emissions from international shipping by at least 50% by 2050 compared to 2008 levels.

**International Civil Aviation Organization (ICAO):** ICAO sets standards and regulations for aviation safety, security, efficiency, and environmental protection. The Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) is a key initiative to address aviation emissions.

**United Nations Framework Convention on Climate Change (UNFCCC):** The UNFCCC oversees global efforts to combat climate change, including transport emissions. The Paris Agreement under the UNFCCC includes commitments from countries to reduce GHG emissions.

**World Health Organization (WHO):** WHO addresses the health impacts of air pollution, including those from transport emissions. The organization advocates for policies that reduce emissions and improve air quality.

## Timeline of Events

**1970s:** The oil crisis prompted a focus on fuel efficiency and the development of smaller, more efficient vehicles, particularly in the U.S. and Europe.

**1992:** The Earth Summit in Rio de Janeiro led to the creation of the UNFCCC, marking the beginning of global climate negotiations, including discussions on transport emissions.

**1995:** The first Conference of the Parties (COP) conference was held in Berlin. COP would be held every year unless the Parties decide otherwise. Negotiations and debates are held at COP conferences revolving climate change.

**1997:** The Kyoto Protocol, the first major international treaty on climate change, included provisions for reducing emissions from various sectors, including transport.

**2008:** The IMO adopted the Energy Efficiency Design Index (EEDI) for new ships, the first globally binding climate regulation for an entire industry sector.

**2015:** The Paris Agreement set the goal of limiting global warming to well below 2°C, with efforts to limit it to 1.5°C. Transport emissions are a key focus area for achieving these targets.

**2016:** ICAO adopted the CORSIA, aimed at stabilizing CO2 emissions from international aviation at 2020 levels.

**2020:** The European Green Deal was launched, setting ambitious targets for reducing transport emissions in the EU by promoting clean energy and electric vehicles.

**2021:** The COP26 summit in Glasgow emphasized the need for accelerated action on transport emissions, with new pledges and initiatives announced.

**2023:** COP28 was held in Dubai. Agreements were made to assist with ending fossil fuels.

## Relevant UN Treaties and Events

**UN Framework Convention on Climate Change (UNFCCC):** The UNFCCC, established in 1992, is the main international treaty for addressing climate change. It provides a framework for international cooperation to reduce GHG emissions, including those from the transport sector. The Paris Agreement, adopted under the UNFCCC, includes commitments to reduce emissions across all sectors, including transport.

**Paris Agreement:** The Paris Agreement, adopted in 2015, is a legally binding international treaty on climate change. It aims to limit global warming to well below 2°C, with efforts to limit it to 1.5°C. Transport emissions are a critical area of focus, with countries required to submit nationally determined contributions (NDCs) that include strategies for reducing emissions from transportation.

**Kyoto Protocol:** The Kyoto Protocol, adopted in 1997, was the first international treaty to set legally binding targets for GHG emissions. While it focused primarily on industrial emissions, the transport sector was also included, particularly in the context of emissions trading and clean development mechanisms.

**CORSIA (Carbon Offsetting and Reduction Scheme for International Aviation):** CORSIA, adopted by ICAO in 2016, is a global market-based measure to address CO2 emissions from international aviation. It aims to stabilize emissions at 2020 levels by requiring airlines to offset their emissions growth beyond these levels through carbon credits.

**International Maritime Organization (IMO) Regulations:** The IMO has adopted several regulations aimed at reducing emissions from international shipping. The Energy Efficiency

Design Index (EEDI) and the Ship Energy Efficiency Management Plan (SEEMP) are key measures to improve the energy efficiency of ships and reduce their carbon footprint.

## Previous Attempts to solve the Issue

**Fuel Efficiency Standards:** Countries like the U.S., EU, and Japan have implemented fuel efficiency standards for vehicles to reduce emissions. These standards have led to the development of more efficient engines and alternative fuels, contributing to a gradual reduction in emissions from road transport.

**Promotion of Public Transport:** Investments in public transport infrastructure, such as buses, trains, and subways, have been promoted to reduce the reliance on private vehicles, thereby lowering transport emissions. Cities like London, Paris, and Tokyo have seen significant reductions in emissions due to robust public transport systems.

**Electric Vehicles (EVs):** The promotion of EVs has been a major strategy in reducing transport emissions. Governments have provided incentives for the purchase of EVs, including tax rebates and subsidies, while also investing in charging infrastructure. Countries like Norway have seen rapid adoption of EVs, contributing to lower emissions.

**Aviation and Maritime Emission Reductions:** ICAO and IMO have implemented regulations to reduce emissions from aviation and maritime transport, respectively. CORSIA and the EEDI are examples of international efforts to limit the environmental impact of these sectors, through many means such as standards on new ships.

**Urban Planning and Sustainable Cities:** Urban planning that promotes walking, cycling, and the use of public transport is another strategy that has been employed to reduce transport emissions. Sustainable cities initiatives aim to design urban environments that minimize the need for private vehicles and encourage low-emission modes of transport.

## Possible Solutions

**Transition to Electric Vehicles:** One of the most promising solutions to reduce transport emissions is the transition to electric vehicles (EVs). EVs produce zero tailpipe emissions and

can significantly reduce CO2 emissions when powered by renewable energy sources. Governments can accelerate this transition by:

- Providing Incentives: Offering subsidies, tax rebates, and other financial incentives to lower the cost of EVs for consumers.

- Investing in Infrastructure: Expanding the charging infrastructure to make EVs more convenient and accessible.

- Supporting Research and Development: Investing in the development of advanced battery technologies to improve the range and efficiency of EVs.

**Enhancing Public Transport:** Improving and expanding public transport systems is crucial for reducing emissions from road transport. Possible actions include:

- Investment in Infrastructure: Developing new public transport lines, modernizing existing ones, and ensuring they are accessible to all.

- Promoting Intermodal Transport: Encouraging the integration of different modes of transport, such as buses, trains, and bicycles, to provide seamless and efficient travel options.

- Implementing Low-Emission Zones: Restricting the use of high-emission vehicles in city centres and promoting the use of public transport.

**Sustainable Aviation and Maritime Transport:** The aviation and maritime sectors must adopt more sustainable practices to reduce their environmental impact. Solutions include:

- Alternative Fuels: Developing and adopting alternative fuels, such as biofuels and hydrogen, that produce lower emissions than conventional fossil fuels.

- Improving Efficiency: Implementing measures to improve the energy efficiency of aircraft and ships, such as lighter materials, more efficient engines, and optimized flight and shipping routes.

- Market-Based Measures: Expanding and strengthening market-based measures like CORSIA and carbon pricing to incentivize the reduction of emissions in these sectors.

**Urban Planning and Sustainable Cities:** Designing cities that promote low-emission transport is another key solution. This can be achieved through:

- Compact Urban Development: Encouraging higher-density development to reduce the distances people need to travel and make public transport more viable.

- Active Transport: Promoting walking and cycling through the development of dedicated lanes and pedestrian-friendly infrastructure.

- Smart Mobility Solutions: Integrating technology into transport systems to optimize routes, reduce congestion, and lower emissions.

**International Cooperation and Policy Alignment:** Addressing global transport emissions requires strong international cooperation. Countries should work together to:

- Harmonize Standards: Align vehicle emissions standards and regulations across regions to ensure consistency and effectiveness.

- Share Best Practices: Exchange knowledge and experiences in reducing transport emissions, particularly between developed and developing countries.

- Support Developing Countries: Provide financial and technical assistance to developing countries to help them transition to low-emission transport systems.

**Renewable Energy Integration:** The integration of renewable energy into the transport sector is critical for reducing its carbon footprint. This can be achieved by:

- Electrification of Transport: Promoting the use of renewable energy to power electric vehicles, trains, and public transport systems.

- Green Hydrogen: Developing green hydrogen as a fuel for heavy-duty vehicles, aviation, and shipping, which are more challenging to electrify.

- Smart Grids: Investing in smart grid technology to manage the increased demand for electricity from the transport sector and ensure it is met with renewable energy.

**Policy and Regulatory Measures:** Governments can implement a range of policies and regulations to drive the reduction of transport emissions:

- Carbon Pricing: Implementing carbon taxes or cap-and-trade systems to internalize the environmental cost of emissions and incentivize low-carbon transport options.

- Fuel Economy Standards: Setting ambitious fuel economy standards for vehicles to reduce fuel consumption and emissions.

- Emission Reduction Targets: Establishing clear and enforceable targets for reducing transport emissions at national and regional levels.

**Public Awareness and Behavioural Change:** Finally, raising public awareness about the impact of transport emissions and encouraging behavioural change is essential. This can be done through:

- Education Campaigns: Informing the public about the benefits of sustainable transport options and the importance of reducing emissions.

- Incentivizing Behavioural Change: Offering incentives for using public transport, cycling, or walking, and disincentivizing the use of high-emission vehicles.

- Corporate Responsibility: Encouraging businesses to adopt sustainable transport practices, such as promoting telecommuting, carpooling, and the use of EVs in their fleets.

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