



## Green Initiatives towards Sustainable Transport

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**Abstract:** Society needs transportation-related policies in place for it to operate at its best. Transport is required for getting to and from work, moving about town, travelling abroad, etc. Delivering varied things on schedule and using multiple modes of transportation is essential for sustained growth and overall productivity. Transportation systems burn fossil-derived fuels, and the emissions they produce contribute to environmental problems like poor air quality, climate change, noise pollution, water pollution, rises in particulate matter, ozone, and nitrogen dioxide concentrations, which have an impact on ecosystems, plants, animals, and human health. Pollutants that released from transportation also spread outside the boundaries of transportation networks. Because transportation consumes a substantial amount of energy, its effects on the environment are enormous. In this paper, an attempt has been made to discuss & review green initiatives for sustainable transport.

**Keywords:** Green Initiatives, Sustainable Transport, Green Transportation, Global Warming

### INTRODUCTION

Today, transportation is a need that we simply cannot live without. However, the current transportation systems are to blame for many problems, such as global warming, environmental degradation, detrimental effects on physical, mental, emotional, and spiritual health, and greenhouse gas emissions. In reality, 23% of the greenhouse gas emissions that result from the burning of fossil fuels caused by the transportation sector. Around 75% of greenhouse gas emissions is attributed to road travel, and if this trend continues unchecked, emissions are likely to increase in the future. Due to everything said above, national governments are under a lot of pressure to create policies that will reduce both the demand for oil and greenhouse gas emissions.

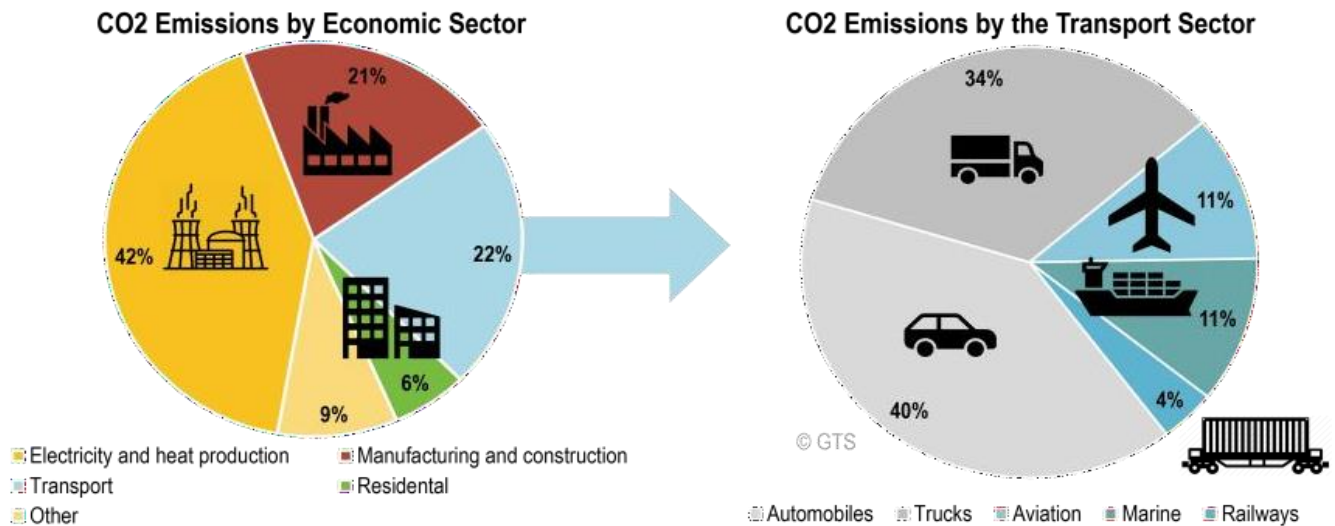
Nearly 95% of all fuel was produced using fossil fuels in 2019. The main contributor to greenhouse gas emissions in the European Union is transportation. In 2019 it is responsible for about 31% of global emissions and 24% of emissions in the EU. Additionally, emissions were only increasing in this one industry prior to the COVID-19 epidemic. Transportation emits greenhouse gases at a faster rate than any other sector that uses energy. Additionally, roadways play a big part in the local air pollution and smog.

### Environmental Impacts of Transportation {Fig 1}

Statistics show that more than 90% of road transportation involves the use of oil. This figure is almost exactly in line with the average global oil consumption of 60%. All of these issues brought to the attention of most governments, and measures taken for regulations to limit this worrisome rise in air pollution. Through emissions from burning fossil fuels, transportation systems contribute to both decreasing air quality and a changing climate. Additionally, through a number of direct and indirect interactions, traffic contributes to ecological disruption, water pollution, and air pollution. As transportation expands and increasingly favors high-speed modes, it projected that these externalities would rise. The primary source of many air pollutants, such as carbon monoxide (CO), carbon dioxide (CO<sub>2</sub>), volatile organic compounds (VOCs), hydrocarbons (HCs), nitrogen oxides (NO<sub>x</sub>), and particulate matter with an aerodynamic diameter of 2.5 μm (PM<sub>2.5</sub>), is now automobile emissions. Human airways easily penetrated by these dangerous particles. Inhaled PM<sub>2.5</sub> can affect the circulatory and respiratory systems by causing local and systemic reactions in the body and reaching the lung alveoli.

The aviation industry may face difficulties due to increased atmospheric turbulence and heat-related aircraft performance degradation. The marine sector might have access to new trade routes when the sea ice melts. In some places, freeze-thaw cycles may have a greater impact on roadways; whilst in others direct heat damage may have an impact on both road and rail systems. Increased frequency of weather extremes might harm infrastructure and affect all transportation networks.

The majority of Asia's mega cities are experiencing severe issues because of rising ambient particulate matter (PM) and nitrogen dioxide (NO<sub>2</sub>) concentrations brought on by the continent's rapid urbanization. The ambient PM and NO<sub>2</sub> concentrations were reported to routinely deviate from WHO recommendations in Shanghai, New Delhi, Mumbai, Guangzhou, Chongqing, Calcutta, Beijing, and Bangkok. Motorized vehicle travel is one of the main sources of pollution in most mega cities across the world. In European cities, 40% of greenhouse gas emissions and 70% of environmental pollutants caused by motorised transportation.

Fig 1.CO<sub>2</sub> emission by various sectors

Source: International Energy Association IEA and IPCC (2014) Summary for Policymakers

### What is Sustainable Transport?

When we talk about Sustainable transportation, we mean modes that have minimal negative effects on society and the environment. Or in other words Any form of transportation that is "green" and has no influence on the environment is referred to as sustainable transportation .The specific vehicles utilize for land, sea, or air travel, the energy source, and the transportation infrastructure (roads, rails, airports, rivers, canals, and terminals) are all factors to consider when considering sustainability. Compared to other energy-consuming industries, transportation has the fastest rate of growth in greenhouse gas emissions. [7] Systems of transportation that are environmentally, socially, and economically sustainable benefit the communities they serve.

### Adopting Sustainable Transport:

In order to be sustainable, transportation must balance our present and future needs. Walking, cycling, taking public transportation, carpooling, car sharing, and using green automobiles are some examples of sustainable mobility. Sustainable transport:

- Enables the basic access and development needs of individuals, enterprises, and society addressed safely and in a way that is consistent with the wellbeing of people and the environment. Promotes equity within and between following generations.
- Utilizes renewable resources at or below their rates of generation, non-renewable resources at or below the rates of development of renewable substitutes, while minimizing the impact on the use of land and the production of noise. Limits emissions and waste within the capacity of the planet to absorb them.

The demand for sustainable development is great. More than merely emissions reduction and operational effectiveness are included in sustainability.

### Benefits of Sustainable/Green Transport

#### Less pollution and cleaner air:

Each driving vehicle releases an average of one pound of CO<sub>2</sub> per mile travelled. When compared to driving alone, using public transit cuts CO<sub>2</sub> emissions by 45%, improving air quality and reducing air pollution. The annual reduction in carbon dioxide emissions in the United States estimated to be 37 million metric tonnes, and even minor increases in bicycle riding might result in reductions of 6 to 4 million tonnes.

#### Improved Community Wellness

An increase in health benefits for locals by better air quality. As a result, there may be a decline in the prevalence of cancer and respiratory conditions like asthma. People are also more likely to exercise outside when the air quality is better.

#### Elimination of Risky Chemicals

We usually only think of petrol when it comes to cars, but they also use antifreeze and other dangerous compounds. When choosing environmentally friendly transportation in place of an automobile.

### Less traffic means fewer roads

More roads will need to be built since there will be more traffic, which will cause water runoff and ground and water contamination. Less automobiles in favor of active transportation, such as bicycles, leads to more bike paths and lanes that are more sustainable.

### Noise Is Also Pollution

We almost never think about noise pollution when it comes to automobiles, unless you live close to a busy street. Less traffic will make your neighborhood more tranquil.

Other advantages of eco-friendly transportation include a healthier lifestyle and an improvement in the standard of living. In addition, there are many ways to practice sustainability at home. This will prevent additional environmental deterioration in addition to reducing energy use.

Table 1 Merits and demerits of Sustainable Vehicles

Merits	Demerits
Highly efficient vehicles that reduce the power consumption	Electric & Hybrid Cars are expensive
Clean vehicles with low CO2 emission	Electric vehicles are not useful for long trips & limited daily driving
Uses renewable energy sources ; solar, water, wind etc.	Battery charging takes long time
Allow sustainable mobility	Initial development is expensive & needs a deep financial study to organize

Source: Semantic Scholar

### Types of Sustainable Vehicles / Transport:

Fuel-efficient cars require less gasoline to function than older ones do. They cut back on both gasoline costs and greenhouse gas emissions. Use the Fuel Economy.gov comparison tools to pick a fuel-efficient vehicle, and the Energy Saver tips to enhance gas mileage and reduce fuel consumption to save money on gas. In hybrid electric vehicles, plug-in hybrid electric vehicles, and all-electric automobiles, electricity is employed to improve vehicle economy. Sustainable mobility options can make use of batteries, clean fuel, or both. Vehicles using advanced technology like fuel cells and hybrid power systems, as well as flexible-fuel and dual-fuel vehicles, may all run on alternative fuels. Alternative fuels contribute to reduced emissions and fuel efficiency. They are made up of propane, electricity, ethanol, hydrogen natural gas, and bio diesel. Modern car batteries provide longer driving distances and quicker charging periods. Their costs are decreasing because of ongoing research and development (R&D). Learn more about EERE's initiatives to improve the electric vehicle batteries.

### Few Initiatives towards Green Transport:

- In 2020, National Electric Mobility Mission Plan (NEMMP) proposed by the Deptt of Heavy Industries, Ministry of Heavy Industries and Public Enterprises.
- The Sustainable Urban Transport Project (SUTP) was launched in 2010 by the MoHUA
- Under the Smart Cities Mission, the Indian government launched the Green Urban Mobility Initiative (GUMI) in 2017.



Fig 2: Green Bus at Nagpur [Source: The Economic Times]

This study focused on analyzing smart city plans, city development plans & master plans of Agra, Ahmedabad, Ajmer, Amritsar, Bhopal, Bhubaneswar, Chandigarh, Chennai, Faridabad, Guwahati, Gwalior, Hubli-Dharwad, Indore, Jabalpur, Kochi, Nagpur, New Town Kolkata, Panaji, Ranchi, Thane, Ujjain (Fig2)

- Aviation fuel blending and modification to reduce air pollution in high altitude (Fig 3)



Fig 3 Aviation fuel blending [Source: www.aerotime.aero]

- Paints used in marine mobility is replaced with eco-friendly (Fig 4)



Fig 4 Marine mobility special paints [Source: Evergreen Line ]

- Use of Paints which are less harmful to aquatic life
- High class people are switching towards Green and healthier way of mobilization

**Conclusion:**

Accessibility can be increased and economic growth can be boosted via sustainable transportation. Better economic integration is achieved through sustainable transportation while maintaining environmental sensitivity. enhancing social fairness, health, city resilience, links between urban and rural communities, and rural production Sustainable transportation is integrated into many SDGs and targets in the 2030 Agenda for Sustainable Development, including those that deal with food security, health, energy, economic growth, infrastructure, cities, and human settlements. The UNFCCC further recognizes the significance of transportation for climate action; the transport sector will play a crucial role in achieving the Paris Agreement given that transportation accounts for nearly a quarter of all energy-related global greenhouse gas emissions and that these emissions are expected to increase significantly over the coming years. Convincing the entire population to switch to green transportation is a difficult undertaking, but with substantial progress, the future of green transportation is only going to become better.

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