



Environmental Sustainability through Eco-Conscious Rides

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ABSTRACT

We are part of the world we are trying to save, and we need to change our ways and reduce our reliance on fossil fuels. Green transportation is one of the answers." **Jane Goodall** Air pollution is a serious problem all around the world today. In recent years, it has become one of the main reasons for poor health in society. The main causes include rapid industrialisation, growing cities, and harmful gases like carbon monoxide (CO), lead, sulphur dioxide, and ozone. Burning fossil fuels also plays a big role in polluting the air. This pollution is not only found outdoors but indoors too. Air pollution leads to many deadly health problems such as heart disease, strokes, lung cancer, asthma, respiratory infections, and even diabetes. According to the Global Burden of Disease study by the Institute for Health Metrics and Evaluation (IHME), air pollution is responsible for about one in every ten deaths worldwide. India is the second most polluted country in the world. Fine particles in the air (PM2.5) reduce the average life expectancy in India by 5.3 years. In some places like Delhi, it drops by 11.9 years, making it the most polluted city globally. Shockingly, all 1.3 billion people in India live in areas where pollution levels are above the safe limits set by the World Health Organization (WHO). This makes air pollution the biggest health threat in the country. From 1998 to 2021, the average air pollution level rose by 67.7%. One of the main sources of air pollution is vehicle emissions, especially in cities. Cars and trucks release harmful chemicals like CO, nitrogen oxides (NOx), and volatile organic compounds (VOCs), which lead to the formation of ground-level ozone and tiny particles that we breathe in. Vehicles also produce carbon dioxide (CO₂), which worsens climate



change. Breathing polluted air for a long time can lead to serious health problems, especially for children and the elderly. Air pollution also harms nature—it pollutes water, soil, and even damages crops and forests. Acid rain caused by SO₂ and NO_x can hurt plants and animals. CO₂ emissions also raise the Earth's temperature, leading to rising sea levels and extreme weather. To reduce pollution from vehicles, we need to switch to green transportation. This means using travel methods that are better for the environment. It helps reduce pollution, save energy, and use cleaner sources like electricity. Green transport options include public buses, electric and hybrid cars, carpooling, cycling, and walking. These methods are important for reducing pollution, fighting climate change, and making our cities healthier and more sustainable

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1. Introduction:

As the world deals with climate change and environmental problems, green transportation is becoming more important. Green transportation means using travel methods that are better for the environment and create less pollution. This includes things like electric cars, bicycles, walking, and public transport. These options help reduce the harmful gases that come from vehicles running on petrol or diesel. Transportation is a big reason for the rise in greenhouse gases, especially because most vehicles burn fossil fuels. This creates carbon dioxide (CO₂), which adds to global warming. But green transportation can help. For example, electric vehicles run on electricity, which can come from renewable sources like solar or wind, and they don't give off smoke or harmful gases. Walking and cycling don't use fuel at all, so they're completely clean ways to travel. Using green transportation isn't just good for the Earth—it can save money too. While things like electric cars or solar-powered transport can cost more at first, they often help people save on fuel and repairs in the long run. Many governments also give discounts or tax benefits to encourage people to choose cleaner options. Green transportation also supports healthier living. Walking and biking are good for physical fitness. Cleaner air from fewer vehicles also means fewer health problems, especially in cities. Public transport can reduce traffic jams, which saves time and makes travel less stressful. Still, there are some challenges. Green vehicles and technology can be expensive at the beginning, and charging stations for electric cars may not be available everywhere. Some people may also be slow to accept the change. That's why



it's important for governments, companies, and people to work together. Building better roads and charging stations, spreading awareness, and making clean transport more affordable are all important steps. In the end, choosing green transportation is a smart and responsible choice. It helps protect the environment, saves natural resources, and keeps the air clean. It may take effort and time, but the long-term rewards are worth it. Everyone—from individuals to leaders—should take this seriously. Green transportation is not just about moving from place to place; it's about choosing a better future for the planet and coming generations.

2. Need of Green Transportation: Traditional vehicles are one of the key contributors to carbon dioxide (CO₂) emissions, which drive global warming. However, shifting to environmentally friendly modes of travel—like electric vehicles (EVs), bicycles, and efficient public transit—can significantly curb these emissions. Cars powered by fossil fuels also release pollutants such as nitrogen oxides and fine particulate matter, both of which degrade air quality and can harm human health. Choosing sustainable transport methods reduces exposure to these hazardous pollutants. Green transport systems rely on renewable energy sources and promote sustainable mobility, thereby easing our dependency on exhaustible resources like petroleum. In many cases, using public transport, walking, or cycling proves to be more economical than maintaining a personal vehicle. Though EVs may require a higher initial investment, they tend to save money in the long run due to lower fuel and maintenance costs. Investing in green infrastructure—such as bike lanes, railway networks, and electric vehicle manufacturing—creates employment in diverse areas including clean energy, urban development, and engineering. Moreover, dependence on imported fossil fuels poses economic and strategic challenges. Adopting domestic renewable sources like solar, wind, and hydropower strengthens energy security. Electric transit systems and battery-powered cars enable better use of clean energy. They also promote public health: walking and cycling improve fitness and help prevent diseases like diabetes and obesity. Reduced emissions lead to cleaner air, which may lower the occurrence of asthma and other respiratory conditions. Efficient public transportation helps reduce congestion, saving time and fuel. Environmentally conscious transport also supports compact urban development, curbing urban sprawl and conserving natural habitats. Unlike diesel-powered buses and trucks, electric alternatives operate more quietly, creating calmer urban environments. As global temperatures climb, adopting low-emission transport options becomes vital in addressing climate change. Innovations such as high-efficiency trains and shared mobility systems are crucial in this transition. Green transport also directly supports global development goals, including:



SDG 7: Access to affordable and clean energy.

SDG 11: Building sustainable cities and communities.

SDG 13: Taking action on climate change.

3. Initiative taken to promote green transportation:

Making transportation more sustainable has become a global necessity due to its far-reaching benefits for the environment, economy, and society. Many nations are now actively promoting the adoption of electric vehicles (EVs) through various measures like financial incentives, tax exemptions, and the establishment of robust charging infrastructure. For instance, regions such as California, China, and the European Union have implemented policies mandating automobile manufacturers to include a certain percentage of EVs in their production lines. In urban areas, developments in public transport systems are also gaining momentum. Cities like Singapore, Seoul, and Bogotá are modernizing their metro networks and enhancing bus connectivity, while China has emerged as a frontrunner by deploying a vast fleet of electric buses. Simultaneously, European cities such as Amsterdam and Copenhagen are prioritizing the safety and accessibility of non-motorized transport, by constructing extensive cycling tracks and pedestrian-friendly zones. The European Union supports these efforts through initiatives aimed at making cities more accommodating for cyclists. Globally, several countries have pledged to eliminate fossil fuel-based vehicles in the near future. Norway is targeting a complete shift to electric cars by 2025, and both the United Kingdom and France have announced bans on the sale of new petrol and diesel vehicles by 2030. International agreements like the Paris Climate Accord further encourage the transition toward cleaner transportation. Research into alternative fuels like hydrogen, biofuels, and synthetic options is underway, with Japan and Germany playing leading roles in hydrogen-powered mobility. Additionally, smart city planning seeks to reduce car dependency by integrating mixed-use development and diverse transport options. Urban centres such as London and Stockholm have implemented congestion pricing to control the use of private vehicles. In India, a comprehensive strategy launched in 2013 aims to make 30% of vehicles electric by 2030. This plan emphasizes financial support, EV-related R&D, and infrastructure development, including widespread charging stations. The country is also pushing for ethanol blending, with a goal of mixing 20% ethanol with petrol by 2025 to curb fossil fuel use. States like Delhi, Maharashtra, and Tamil Nadu have introduced their own EV policies, offering benefits to both consumers and manufacturers. Cities such as Delhi, Bengaluru, and Mumbai are adding electric buses to their public fleets, while metro rail



projects are being expanded in places like Hyderabad and Bengaluru. A national program is also in place to integrate various modes of transport, and to promote non-motorized mobility through bicycle lanes, pedestrian pathways, and EV charging points. Green hydrogen is being explored as a fuel for heavy vehicles like buses and trucks, aiming to cut down on emissions. Furthermore, incentives are in place to encourage battery production and recycling to tackle e-waste. Initiatives such as dedicated cycling infrastructure and car-free days are helping shift people toward sustainable transport options. India is collaborating with international bodies like the International Energy Agency and the United Nations, and is an active participant in the Global EV Alliance and the EV100 campaign led by The Climate Group. Faster Adoption and Manufacturing of Hybrid and Electric Vehicles (FAME) Scheme

FAME I (2015): This program supported pilot projects and offered rewards for using EVs.

FAME II (2019): This increased financial help for EVs, especially for public transport like e-buses and e-rickshaws, and for setting up charging stations. initiative.

4. Challenges: Making transportation eco-friendly is now very important across the world because it helps the environment, saves money, and benefits society. Many countries are encouraging people to use electric vehicles (EVs) by giving financial support, tax benefits, and setting up more charging stations. For example, places like California, China, and the European Union have made rules for car makers to produce a certain number of EVs. At the same time, many cities are improving their public transport systems. Cities such as Singapore, Seoul, and Bogotá are upgrading their metro lines and bus networks, and China is leading by using a large number of electric buses. In Europe, cities like Amsterdam and Copenhagen are making it safer and easier to walk or cycle by building bike lanes and pedestrian areas. The European Union is also supporting these efforts to make cities more bike-friendly. Across the globe, many countries have promised to stop using vehicles that run on petrol or diesel in the coming years. Norway plans to switch completely to electric cars by 2025. The UK and France have said they will stop selling new petrol and diesel cars by 2030. International agreements like the Paris Climate Deal are also pushing countries to use cleaner forms of transport. Some countries are also working on new fuels like hydrogen and biofuels. Japan and Germany are leading in hydrogen-powered transport. Cities are also being planned in smarter ways to reduce the need for private cars, by mixing homes, shops, and workspaces and offering more public transport options. Cities like London and Stockholm have also started charging cars to enter busy areas, to reduce traffic. In India, a national plan started in 2013 aims to make 30% of all vehicle's electric by 2030. This plan



includes financial help, support for EV research, and more charging stations. The government is also promoting ethanol blending, aiming to mix 20% ethanol with petrol by 2025 to reduce fuel use. States like Delhi, Maharashtra, and Tamil Nadu have their own EV policies that give benefits to buyers and manufacturers. Cities such as Delhi, Bengaluru, and Mumbai are adding electric buses to public transport, while metro services are expanding in cities like Hyderabad and Bengaluru. The country is also working on connecting different transport types and promoting walking and cycling by building bike lanes, footpaths, and charging spots for EVs. India is looking into using green hydrogen to fuel big vehicles like trucks and buses to cut down pollution. Incentives are also being given for making and recycling batteries to reduce electronic waste. Events like car-free days and better cycling paths are helping people shift to greener ways of travel. India is also working with global organizations like the International Energy Agency and the United Nations and is part of campaigns like the Global EV Alliance and EV100 to support clean transport worldwide.

5. Solutions: To make transportation truly sustainable, we need to rethink how our cities are built and how people move around. Building a network of electric vehicle (EV) charging stations, dedicated bike lanes, and pedestrian-friendly zones can make a huge difference. Public transport should be reliable, affordable, and simple to navigate so that more people feel encouraged to use it. Governments can help by offering financial support—whether it's subsidies for purchasing electric cars and bicycles, or incentives for using buses and trains. Businesses, too, should be motivated to invest in greener transportation methods through targeted rewards and policy benefits. Using renewable energy like solar or wind to power EVs is another key step. Promoting decentralized, local energy systems ensures clean power is more accessible. To strengthen this shift, policymakers should introduce stricter measures—like taxing high-emission vehicles—to speed up the transition. City planning plays a major role. Urban layouts should make sustainable travel easy and efficient. This means creating compact, mixed-use neighbourhoods where daily needs are close by, reducing the need for long commutes. At the same time, improving the flow between buses, trains, and bicycles helps people switch between modes without hassle.

Investing in research is essential. Better, longer-lasting, and more affordable batteries could revolutionize the EV market. Smart technologies and shared transport options—like ride-hailing or on-demand shuttles—can cut down on congestion and pollution. Spreading awareness is just as important. Campaigns that highlight the benefits of eco-friendly travel can encourage walking, biking, or carpooling. Digital tools and mobile apps that offer live transport updates and ticketing options make it



easier to leave the car at home. Ultimately, the way we design and grow our cities has a lasting impact. Many urban areas are still too car-dependent because they spread out too much and prioritize vehicle traffic over green alternatives. To fix this, we need to plan smarter, grow more compactly, and focus on giving people clean, practical ways to get where they need to go.

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