

ANALYSIS OF WAYS TO REDUCE THE NEGATIVE IMPACT OF CARS ON THE ENVIRONMENT USING ARTIFICIAL INTELLIGENCE

Jurayev Vokhidjon Islomjon ugli
Andijan State Technical Institute
Transport Logistics, Teacher
vohidjonjayev95@gmail.com

Annotation: This article presents the results of scientific and practical work on the harmful effects and consequences of toxic gases emitted by internal combustion engine cars and vehicles on human health, animal and plant life, and the environment. In addition, every year many people suffer from diseases associated with exhaust and gases emitted by cars, as well as their noise. Today, this process has a negative impact on every country in the world. Unfortunately, such changes have little effect in Uzbekistan.

Keywords: Road transport, environment, exhaust gases, nitrogen oxides, hydrocarbons, carbon monoxide, soot, car engine, gasoline, noise.

Introduction. Nowadays, the environmental safety of road transport remains one of the pressing issues. One of the ways to solve this issue is to reduce the toxicity of exhaust gases (EGG) emitted from cars in operation. In the current conditions, road transport was considered the main consumer of petroleum products. 20 percent of the extracted oil is spent on the development of fuels and lubricants. In addition, 78 percent of exhaust gases emitted into the atmosphere are accounted for by road transport [1].

Passenger cars are mainly equipped with piston internal combustion engines running on gasoline. Currently, the production of alternative engines to this type of engine has not been launched, and at the same time, increasing the energy and environmental efficiency of piston internal combustion engines remains relevant [2].

It is known that when cars are operated in urban conditions, engine idling accounts for 42% of the total engine performance, which leads to an increase in fuel consumption and the amount of exhaust gases emitted into the atmosphere. Certain methods of engine control do not allow reducing the indicated disadvantages. One of the ways to reduce fuel consumption and exhaust gas toxicity is to use the method of turning off part of the cylinder when the engine is idling. At the same time, the methodology for calculating and normalizing fuel consumption does not allow assessing the quantitative and qualitative impact of turning off part of the engine cylinder on 5 fuel-efficient, environmental and vibroacoustic indicators [3].

The head of our state, President Shavkat Mirziyoyev Miromonovich, is carrying out a number of major reforms in a short period of time, including the development of the transport sector, which is the lifeblood of the economy, as well as environmental protection and improvement of the ecological situation, which are global problems of today. As evidence of this, we can cite the following decrees and resolutions.

The Role of Artificial Intelligence in Reducing the Environmental Impact of Cars

Artificial Intelligence (AI) plays an increasingly vital role in the effort to reduce the negative environmental impact caused by automobiles. Traditional vehicles contribute significantly to air pollution, greenhouse gas emissions, and energy consumption. However, with advancements in

AI, innovative solutions are being developed to make transportation more sustainable and eco-friendly.

One of the most impactful applications of AI is in optimizing traffic flow. Through smart traffic management systems, AI analyzes real-time data from traffic sensors, cameras, and GPS to reduce congestion, idling time, and fuel consumption. By minimizing stop-and-go driving patterns, these systems significantly cut down emissions in urban environments.

Another important area is predictive maintenance. AI algorithms can monitor the health of a vehicle and predict potential mechanical failures before they happen. This reduces the chance of inefficient engine performance and helps maintain fuel efficiency, ultimately reducing harmful emissions.

AI is also central to the development of autonomous and electric vehicles (EVs). Self-driving technology, powered by AI, can operate vehicles more efficiently than human drivers, using optimal acceleration, braking, and routing techniques. Additionally, AI helps in managing EV charging networks, ensuring efficient energy distribution and promoting the adoption of cleaner transportation.

Furthermore, AI assists in eco-routing, which helps drivers choose routes with the lowest environmental impact based on real-time data such as terrain, traffic, and weather. This not only saves fuel but also lowers the vehicle's carbon footprint.

PQ-3956 dated 03.10.2018 On additional measures to improve the state management system in the field of ecology and environmental protection, this resolution provides for the establishment of a Republican Ecological Committee on its basis, which will carry out sectoral inspections, control the protection and use of biodiversity and protected natural areas, specialize in ecology and environmental protection, sanitary cleaning, create a center for the introduction and development of information and communication technologies and the system of air quality, and create a center for the introduction of environmental information, information and communication technologies and multimedia in the form of a state unitary enterprise. These structures are currently asking their own question, including representatives of the transport sector, and are waiting for an answer, that is, when and how will the negative impact of the transport industry on nature and people be reduced?

Today, nature conservation is becoming a global problem. The toxic fumes emitted by today's vehicles, which are harmful to nature, are destroying the ozone layer. This thesis can serve as a basis against the release of various biochemical pollutants into nature that are poisoning nature and answers all the questions that torment us. From the time when a person became conscious and felt the need to act independently, he had to take on a certain responsibility - care for nature and the environment. Today, it is the ecological problem that has become one of the global problems that worries the whole world. Therefore, now every person with an independent mind who can direct himself towards a certain action, whether he is young or old, is equally responsible for nature.

Research Methods: Environmental regulations have reduced vehicle emissions in developed countries, but this has been offset by an increase in the number of vehicles and the use of each vehicle (an effect known as the "Jevons paradox"). Some ways to reduce road vehicle carbon emissions have been studied more extensively. Energy use and emissions vary significantly between modes, leading environmentalists to call for a shift from air and road to rail and passenger transportation, and for increased transportation electrification and energy efficiency. The transportation sector is a major source of greenhouse gas emissions (GHGs) in the United States. An estimated 35 percent of the nation's emissions are directly attributable to

transportation, with some regions accounting for even higher proportions. Transportation is the largest source of greenhouse gases in the United States, accounting for 52 percent. The net increase in total U.S. emissions since 1991. The impact of transportation systems on other environmental include traffic congestion and car-driven urban sprawl, which can consume natural habitats and agricultural land. Globally, reducing transport emissions is expected to have a positive impact on the Earth by reducing air quality, acid rain, smog and climate change. The health effects of transport emissions are also of concern. Studies on the effects of traffic emissions on pregnancy outcomes have shown that emissions are associated with adverse effects on the duration of pregnancy and, possibly, intrauterine growth. To date, human-made technologies have had a negative impact on nature. Examples of these include toxic gases emitted by cars. According to data, 1.2 million tons or 61 percent of atmospheric emissions are caused by vehicles, and 930 thousand tons (45 percent) by industrial enterprises. Because the number of cars per year Increasingly, traffic jams are increasing on the roads, and the presence of cars in a large traffic jam leads to the spread of toxic substances in one place. Such situations mainly occur at busy urban intersections, which is probably why people living in mountainous areas experience headaches, nausea, and other symptoms of polluted air when they come to the city. The gases emitted into the atmosphere during the combustion of fuel in automobile engines contain more than 300 toxic compounds, 60% of which are emitted into the atmosphere in the form of aerosols by motor vehicles. The share of pollutants emitted into the atmosphere by automobiles has reached 52 percent, while in the 1970s this figure was only 10-15 percent. In large cities and modern megacities, this figure can reach 65-70%. In addition, the amount of emissions increases by about 5% every year and this is a serious concern. According to the World Health Organization, environmental pollution caused by road transport is characterized by the following indicators: for example, in the United States, 149 million tons of harmful substances are released into the atmosphere every year, of which 89 million tons are produced by the operation of cars. Do environmentally friendly cars or “green” cars have a less negative impact on the environment than regular cars?

After all, environmental problems know no borders, they cause transboundary problems between countries, and this in itself has a negative impact on socio-economic relations and development [4].

The world community has adopted a number of internationally binding documents to address various issues arising from science, technology, and economic development, as well as to prevent problems, including the “Climate Change Convention”, the “Kyoto Protocol” and the “Rio Declaration”.

These documents provide for the implementation of organizational measures aimed at reducing the negative factors leading to climate change, preventing technical pollution of the environment, preventing disruption of the natural balance through the rational use of natural resources, and protecting public health.

In recent years, sales of sustainable vehicles in Europe have increased - electric cars, hybrids, and hydrogen-powered vehicles.

According to information published by the European Automobile Manufacturers Association - the “Autostat” analytical agency, more than 500 thousand such cars were purchased in the markets of the European Union and the European Free Trade Association, which is 20.3 percent more than last year.

Theoretical and practical significance of the research results.

Currently, hybrid power units are used, which are the most efficient in terms of economy and environmental parameters: they operate on highways with an internal combustion engine, and in urban areas with an electric motor. Switching to one or another type of engine is carried out automatically depending on the traffic and road conditions.

The third way to reduce the toxicity of exhaust gases is to install additional devices on the exhaust pipes, that is, afterburners, which are equipped with expensive catalysts that neutralize toxins. The additional device increases the cost of the car, reduces its power and economy, we could not achieve economy and environmental friendliness with the two above methods, so we have to use devices that reduce the toxicity of various types of exhaust gases.

CONCLUSION

The composition of gases emitted by cars and their toxic effects on the environment and humans were studied.

Measures to reduce the toxicity of gases emitted by road transport were studied.

The work of scientists on the use of the method of turning off cylinders during engine idling to improve the resource efficiency and environmental performance of vehicles was studied.

One of the directions for ensuring resource efficiency and environmental safety in the automotive complex is to improve the fuel efficiency and environmental performance of vehicles in operational conditions.

Currently, hybrid power units are used, which are the most efficient in terms of economy and environmental parameters: they operate on highways with an internal combustion engine, and in urban areas with an electric motor. Switching to one or another type of engine is carried out automatically depending on traffic and road conditions.

REFERENCES:

1. Omonov FA, Jorayev VI PROBLEMS AND CAUSING FACTORS IN THE DEVELOPMENT OF FERGANA CITY PUBLIC TRANSPORT //European Journal of Emerging Technology and Discoveries. – 2023. – T. 1. – No. 2. – pp. 72-75.
2. Islamjon o'g JV et al. CONVENIENCES CREATED TO PASSENGERS WHEN USING PUBLIC TRANSPORT SERVICES //Education news: research in the 21st century. – 2023. – T. 2. – No. 14. – pp. 138-146.
3. Islamjon o'g JV et al. METHODOLOGY OF ESTIMATING THE CONSUMPTION OF MATERIAL RESOURCES IN THE OPERATION OF THE BUS PARK //Mechatronics and robotics: problems and development prospects. – 2023. – T. 1. – No. 1. – pp. 266-267.
4. Ikromov N. et al. Analysis of transport and its cargo processes // E3S Web of Conferences. – EDP sciences, 2024. – T. 548. – B. 03021.