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THE TENDENCIES OF ROAD TRANSPORTATION'S IMPACT ON THE ENVIRONMENT

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The article focuses on the environmental issues of road transportation. Despite the steady decline in the amount of pollutants released into the atmosphere by transport vehicles over the past 10 years, there is a tendency to increase the share of road transport in the total cargo turnover and the volume of goods transported, which can lead to serious environmental consequences unless all the necessary measures are taken.

The impact of transport on the environment is highly negative. There are more and more trucks on the roads, especially large and oversized ones, which release unhealthy substances into the air. When the truck is running, the atmosphere receives approximately sixty different types of chemicals which are mainly toxins, such as hydrocarbons, soot, carbon monoxide and lead.

The transportation sector consumes a significant amount of fuel, energy and other non-renewable resources while performing its important socio-economic functions. The environment and society suffer considerable environmental damage at all stages of the production, operation and disposal of motor vehicles. This damage includes:

- the emission of pollutants into the atmospheric air (figure 1);
- noise and vibration;
- the pollution of soil and water resources;
- waste generation;
- the withdrawal of land and forest resources during the construction of transport infrastructure.

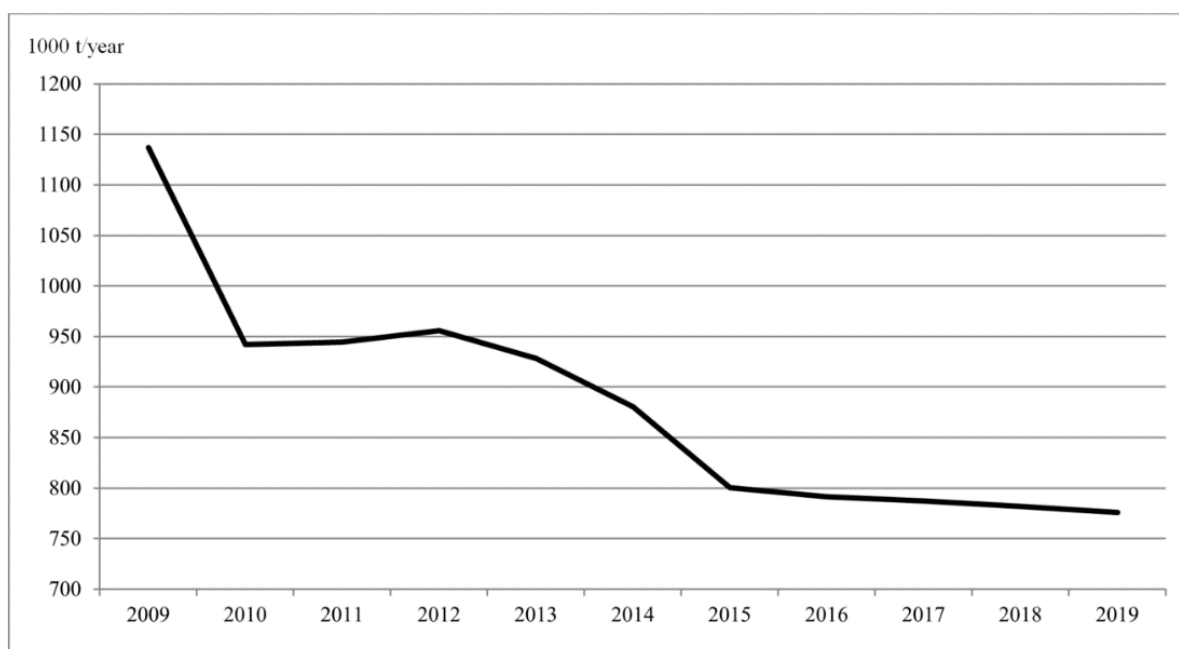


Fig. 1. – The amount of pollutants released into the atmosphere by transport vehicles [1]

The effects of automobile pollution are widespread, affecting the quality of air, soil, and water. Nitrous oxide contributes to the depletion of the ozone layer, which protects the Earth from the harmful ultraviolet radiation of the Sun. Pollution is one of the main causes of global warming. Cars and trucks emit carbon dioxide and other greenhouse gases into the atmosphere, which account for a fifth of the total global warming pollution. Greenhouse gases trap heat in the atmosphere, causing temperatures to rise around the world. Without greenhouse gases, the Earth would be covered in ice, but the burning of excessive amounts of fossil fuels, such as gasoline and diesel, has caused global temperatures to rise by 0.6 degrees Celsius, or 1 degree F, since the pre-industrial period, and this will continue in the coming decades. Higher global temperatures are affecting agriculture, wildlife, sea levels, and natural landscapes.

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Sulfur dioxide and nitrogen mix with rainwater, creating acid rain that damages crops, forests and other vegetation, and buildings. Oil and fuel spills from cars and trucks seep into the soil near highways, and fuel and particulate matter from vehicle emissions pollute lakes, rivers and wetlands.

Automobile exhaust fumes can be extremely harmful to human health. For example, carbon monoxide has no taste and smell, but at high concentrations it causes dizziness, headache, nausea, and can even lead to fainting. Hydrocarbons in car emissions are oxidized when exposed to sunlight. They form toxic compounds with a pungent smell which especially strongly affect the functioning of the upper respiratory tract and lead to the exacerbations of the respiratory system's chronic diseases. Constant exposure of the body to exhaust fumes can lead to immunodeficiency, bronchitis and the overall bad state of the nervous system and other organs. In addition, most of the toxic substances that make up the exhaust gases can interact with each other and with other components of the atmosphere, which contributes to the formation of smog. Car noise is also harmful damaging hearing and causing psychological distress.

The problem of air pollution is becoming more acute due to a sharp increase in the fleet of vehicles, the total power of engines, and the consumption of fuel and energy resources. The most harmful impact of the transport power system on the environment in general and the atmospheric air in particular is caused by road transport, which accounts for more than 80% of the total emissions of harmful substances into the atmospheric air from mobile sources of pollution. A significant increase in the fleet of vehicles entails an increase in fuel consumption, primarily diesel, with an almost constant increase in gasoline consumption.

Amid growing demand for road transport services in Belarus, there are a number of unresolved problems such as aging vehicle fleet, insufficient technological level of transport equipment and the absence of interaction between various transport-related industries.

Despite the steady decline in the amount of pollutants released into the atmosphere by transport vehicles over the past 10 years, there is a tendency to increase the share of road transport in the total cargo turnover and the volume of goods transported (figure 2).

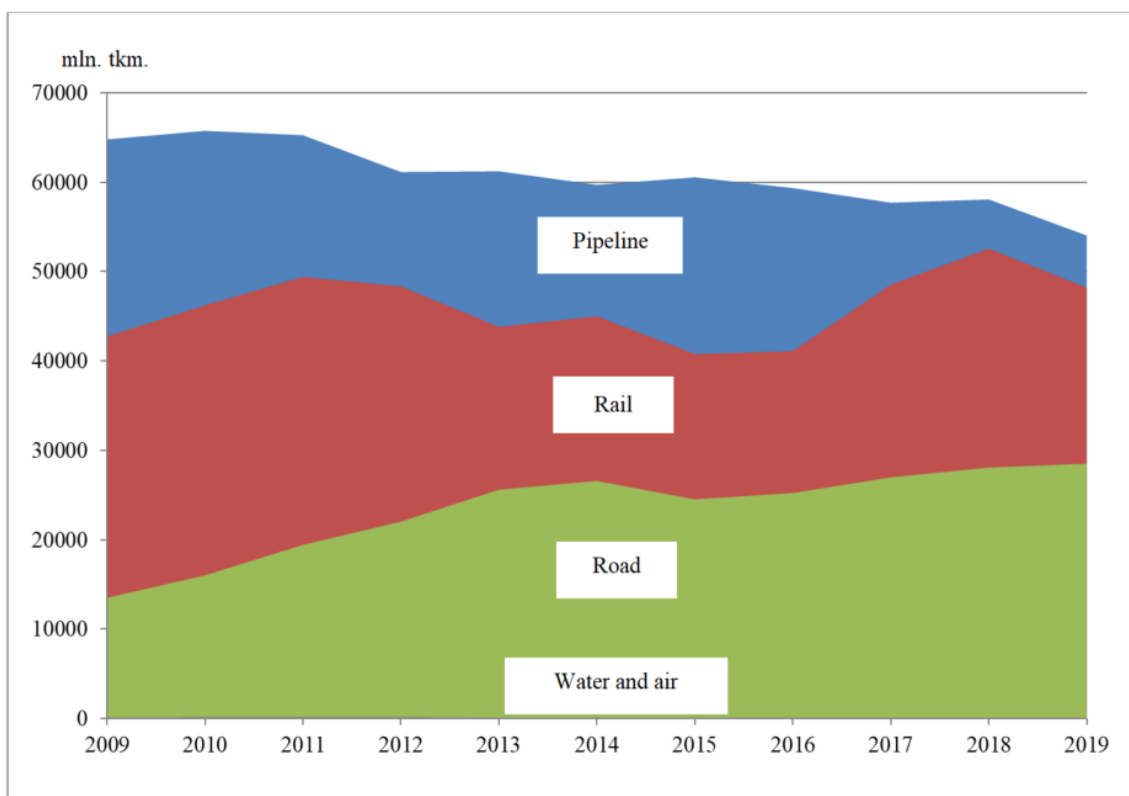


Fig. 2. – Cargo turnover by various types of transport [2]

Legal regulation in the field of reducing the harmful effects of transport on the atmospheric air should be enhanced (the development and implementation of normative legal acts in order to promote the production and operation of vehicles that meet modern requirements in the field of environmental safety and the improvement of the system of emissions and smokiness regulation).

For example, EURO-6 ecological class trucks imported to the territory of Belarus are exempt from the recycling fee and value-added tax. This was stipulated by Decree No. 102, which was signed by the country's president. Such trucks include truck tractors, which were produced no more than one year ago, with a gross vehicle weight of more than 12 tons, but not more than 20 tons, and motor vehicles, which were produced no more than one year ago, for the transport of goods with a gross vehicle weight of more than 20 tons, but not more than 50 tons. The document was adopted in order to create conditions for the qualitative renewal of the fleet of Belarusian international carriers through the purchase of modern vehicles of high ecological class [3].

Fuel efficiency and environmental friendliness can be achieved by the improved working process of internal combustion engines, the introduction of low-toxic and cost-effective ways of equipment adjustment, the development and implementation of exhaust gas neutralizers and by the reduction of the vehicle's own weight.

It is necessary that fuel with improved environmental performance should be used (the reduction of the content of sulfur, benzene and aromatic hydrocarbons in gasoline and diesel fuel and the elimination of metal-containing additives). Biodiesel is an eco-friendly fuel for transport: in comparison with conventional diesel fuel, it contains almost no sulfur and at the same time undergoes almost complete biological decomposition. In the soil or in the water, microorganisms process 99% of biodiesel in 28 days – this minimizes the degree of pollution of rivers and lakes [4].

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