

## ENVIRONMENTAL SAFETY OF ROAD TRANSPORT

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Road transportation has positive effects on the economy, but negative effects on environmental safety. The magnitude of the road-safety problem worldwide has been recognized for decades. Similarly, many environmental effects of road transportation have been discussed for a long time. However, the recent discussion of climate change has brought to the forefront the need to significantly curb greenhouse gas (GHG) emissions produced by road transportation. Current transportation is predominantly based on the combustion of fossil fuels, making it one of the largest sources of air pollution and greenhouse gases. Furthermore, transportation is the cause of other environmental effects, such as noise pollution and the loss of land and open space. On the average in Ukraine the exhaust gases of motor vehicles funds cause 40-45% of air pollution, but in cities they give more than 50% of air pollution, and in large cities (from 0,5 million to 1-1,5 million inhabitants) account for 55-70% of them, and very large ones (several million inhabitants) cities-more than 85% of the total air pollution [2, 4].

Ukrainian cars of so called “middle age” produce 8-10 times more harmful substances than the like are emitted into the atmosphere in the European countries. Proper regulation of the fuel system of cars makes it possible to reduce the amount of harmful substances by 1,5 times, and special neutralizers (Catalytic igniters) – reduce exhaust toxicity by 6 or more times [1, 3]. Therefore, the problem of reducing the negative impact on the environmental road transport at all stages of its life cycle is relevant. We consider that priority areas for improving environmental safety road transport at all stages of its life cycle are:

- 1) various ways of reducing toxic components in environmental (for example, introduction of new engine designs, use of new types of power equipment, use of devices with flue gas neutralization or neutralization, development or improvement of existing standards, control procedures);

- 2) designing and manufacturing of new types of vehicles which can be quickly disassembled, and reused in the future, and their proper disposal (many countries in the world plan to replace most of the cars with internal combustion engines for electric vehicles). In our opinion, it is necessary to provide continuous increase of environmental friendly materials in production and exercising control over the use of materials in the construction of automobiles harmful substance;

3) improving the ecology of big cities by meeting the requirements environmental legislation, application of world practice in the organization of zones with a low-emission zone (LEZ) and zero-emissions zones (ZEX);

4) the use of alternative eco-friendly types of vehicles such as electric scooters, electric bikes, monocycles, or principles co-ownership of cars. Such vehicles have several advantages – they are compact, easy to use, eco-friendly and available;

5) the use of mobile applications for carsharing, which allow owning a car together with other people and owning a car share with the right to use it. The model of carsharing is intended to satisfy the traditional desire of people to move quickly and conveniently from one place to another, and it also allows to save time and money.

Thus, we can admit that road transport is one of the main sources of the environmental pollution. The existing level of ecological safety of the automobile transport complex as a whole and its main elements determined by the level of energy and resource consumption, environmental pollution by emissions and waste in the process of vehicle operation. To conclude, we consider that only a comprehensive approach, and the application of innovative methods for reducing negative impact will allow to ensure environmentally sustainable development of the road transport safety.

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## **PRINCIPLES OF BIONICS IN MODERN ARCHITECTURE**

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Bionics is an applied science connected with the usage of organization principles, peculiarities and functions of living organisms during the creation of new technologies. In other words, it is the studying of natural forms and shapes and imitating them in the process of engineering.