

## **Monitoring of the Hazard Criteria's of an Atmosphere Pollution**

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### **ABSTRACT**

The degree of air pollution in cities is mainly determined by the number of emission sources and the concentration of pollutants emitted into the atmosphere. The study of urban pollution is the first step in solving the problem of ensuring normal environmental conditions for the population with minimal damage to the population. Intensive development of industry, agriculture, transport, urbanization, as well as the development of new territories has led to a significant increase in emissions of harmful substances into the environment, which adversely affect people and the environment. In this regard, the study of the processes and causes of environmental pollution has received significant development.

Atmospheric air, in addition to such important components as nitrogen, oxygen, carbon dioxide, contains in various quantities many other substances. The former relates to atmospheric constituents; the latter pollute it. Most often, atmospheric pollution is understood to mean the presence in the air of various gaseous and solid substances that adversely affect living organisms and vegetation, worsen their living conditions or cause material damage.

The level of highway gas contamination and primary territories depends on the intensity of traffic, the width, and topography of the street, wind speed, the share of freight transport and buses in the total flow and other factors. With a traffic intensity of 500 transport units per hour, the concentration of carbon monoxide in an open area at a distance of 30-40 m from the highway decreases by 3 times and reaches the norm. Difficult dispersion of car emissions in tight streets. Environmental pollution by automobiles is almost impossible to localize; the population of the city is exposed to residential buildings. As a result, almost all city residents experience the harmful effects of polluted air. Harmful emissions are concentrated near the surface and their concentration here under certain conditions increases significantly. This is especially dangerous in light winds or calm weather. The effects of pollution are exacerbated by fogs, when the concentration of mixtures in the lower layer increases, and the effect of some of them, such as sulfur dioxide, becomes more toxic. In assessing air pollution, the period during which pollutants are stored is important. Accumulating in the atmosphere, pollutants interact with each other, hydrolyze and oxidize under the influence of moisture and oxygen, and also change their properties under the influence of radiation. As a result, the duration of toxic impurities in the atmosphere is closely related to their chemical properties.

In Nalchik, control over the traffic intensity is not conducted. There are no data on the traffic regime of different categories of transport at different time and seasons. No studies are being conducted on the impact of traffic on the environment and public health. The air pool is a vital component of the natural environment. The breathing process is inherent in all living organisms. Pollutants from stationary and mobile sources are emitted into the atmosphere. Mobile sources contribute up to 98% of the total mass of emissions (various sources) of harmful substances into the environment. Unlike industrial enterprises, the emission of which is concentrated in a certain zone, a car disperses products of incomplete fuel combustion almost throughout the territory of cities, and directly in the surface layer of the atmosphere.



This work aims to identify the maximum possible concentration of pollutants emitted by road into the atmosphere of the city of Nalchik. The city of Nalchik is the capital of the Kabardino - Balkarian Republic, located in the foothills of the Greater Caucasus on the river. Nalchik (Terek River basin). Nalchik is a resort town. The climate of the city is temperate continental, moderately hot, and belongs to the first climatic zone. The main factors determining the climatic conditions are the terrain, the direction of the prevailing winds and the features of atmospheric circulation.

Of all modes of transport, the largest share in air pollution is the automobile. The influence of other modes of transport is not so significant and is manifested in places where its objects are concentrated. The streets of Nalchik are narrow and not always linear, which is good conditions for stagnation of polluted air in the surface layer of the atmosphere. The houses adjacent to the motorways mainly consist of 3-5 storey buildings, less often - 1, 9-storey buildings. To determine the concentrations of gaseous toxins and soot that enter the roadside space with the exhaust gases of vehicles, both the calculation method and the natural determination method are used. The calculation is conducted for streets with the highest traffic load. Selected highways and junctions apply to the schematic map of the city. To identify the maximum load on congestion, studies were carried out during the hours of the maximum load of road landscapes. For the calculation, the maximum number of vehicles traveling for 20 minutes is used.

To assess the traffic load in the zone of controlled intersections, additional studies were conducted. Consistently in each direction of movement during the period of red light (including yellow), calculations of vehicles are carried out (by groups), forming a "turn". The distribution of concentrations of pollutants is calculated using the software. From the analysis of traffic flow observations on the road landscapes of Nalchik, it was revealed that the maximum number of vehicles is observed on Malbakhova, Kabardinskaya, Idarova streets and at the intersections of Malbakhova-Kirov, Kabardinskaya-Idarova, Kabardinskaya-Osetinskaya streets.

Emission calculations are carried out according to the methodology for the following harmful substances entering the atmosphere with the exhaust gases of cars:

- carbon monoxide (CO);
- nitrogen oxides NO<sub>x</sub> (in terms of nitrogen dioxide);
- hydrocarbons (CH);
- soot;
- sulfur dioxide (SO<sub>2</sub>);
- formaldehyde;
- benzopyrene.

Therefore, by using the calculation and the natural determination method to count the concentration of pollutants entering the atmosphere from vehicles, we found that the emissions of vehicles in some streets exceed the maximum permissible concentration. The main software tool for conducting settlement monitoring is the Ecologist program developed by Integral (St. Petersburg). All calculated points with concentrations of pollutants in Nalchik were mapped.