

*Materials of Conferences*

**THE ATMOSPHERIC AIR STATE  
IN THE TERRITORIES  
OF THE MOTORWAYS  
OF THE CITY OF TYUMEN**

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Ecological problems of cities are significantly intensified due to dominating impact of car transport upon the environment. Mechanism of cars' impact upon it has a number of special features. Therefore, evaluation of air pollution level in cities, considering the impact of car transport turns to be an extremely urgent task.

Steadily increasing transport loading in modern urbanized environment is the cause of increased pollution level of the atmosphere air on territories that lay by transport flows and in distant locations. Therefore, utilizing methods of layouts plays a significant part in providing comfortable living conditions in urban environment. Those are measures of developing road-transport complex, and here it is necessary to carry out technological and planning actions, considering ecological requirements.

Studying concentrations of substances in atmosphere air is typical for any city. According to federal requirements, tree groups of substances must be controlled in the atmosphere:

1. Major substances; general weighed matters (dust), nitrogen dioxide, carbon oxide, sulphur dioxide. Studying concentrations of these substances is necessary in all cities.

2. Specific substances: ammonia, benzopyrene, benzol, and other aromatic carbohydrates, cadmium, nickel, quicksilver, lead, carbon bisulphide, hydrogen sulphide, phenol, formaldehyde, hydrogen fluoride.

3. Ozone and small weighed particles. It is also necessary to establish studying of concentrations of these substances.

Analysis of atmosphere condition in the city of Tyumen, according to official information sources, testifies that car transport carries the most of negative impact upon the quality of air in territories that lay by motorways. According to the data of hydro-meteorological services that tracks air pollution levels on the territory of Russia, Tyumen is present in the list of 30 cities, in which extremely high level of atmosphere pollution on carbon dioxide, formaldehyde, and benzopyrene is observed.

The main source of experimental information to define background in Tyumen is the data of stationed centers of monitoring atmosphere pollution. A selection of location of stationed centers within organization of monitoring atmosphere pollution in

the city was carried out by hydro-meteorological bodies in 1967-2004 in accordance to the requirements of regulative documents: State Standard 17.2.2.01-86 «Nature protection. Atmosphere. Rules of air quality control in populated areas»; Regulating Document 52.04.186-89 «Guidance to control atmosphere pollution». According to the functional zoning, there are 5 stationed centers of observation in the city, they are conditionally divided into car, industrial, and city background. These centers, according to specialists of hydro-meteorological service, are representative and reflect the actual situation of atmosphere pollution, which is, regretfully, unfavourable.

Nowadays two posts of «city background» type are located in areas of city car transport impact, and, due to this fact, correct conclusions on a situation cannot be done, and managing measures cannot be taken considering specific impact sources. This condition served as a basis to choose studies of concentration of polluting substances that are contained in car transport emission on territories that lay by city motorways.

Recently, to obtain experimental information on the level of atmosphere pollution on specific territories of Tyumen, route observations of transport flows within street-road network are carried out on foundations of certificated laboratories.

Observations of concentration of polluting substances in the city motorways were carried out by mobile laboratory «LesParkKhoz» during 2008 and 2009. The laboratory was provided with modern equipment that allowed to obtain operative and complete information on the degree of pollution of atmosphere in different city points on: sulphur dioxide, carbon oxide, nitrogen dioxide, nitrogen oxide, carbon-black, phenol, formaldehyde. Observation posts of this laboratory were located near motorways. The number of sample-taking points in transport infrastructure equaled 3 in 2008, and 4 in 2009. Periodicity of taking samples in each controlled point – two times a month. The observations provided us with the following results: insignificant exceed of the utmost limits on nitrogen dioxide – 1,1 MPC one time concentration; on formaldehyde – 1,1 MPC one time concentration; on carbon-black – 1,1 MPC one time concentration on motorway Shirotnaya street – N. Federova street; concentrations of nitrogen oxide, sulphur anhydride, and dust were within and on the limits of standards.

Studies on location were also carried out on bases of analytic laboratory Federal state training center «Center of hygiene and epidemiology in Tyumen region» during 2009-2010. Observations were carried out at observation points on minimal

sufficient indications that allowed us to control ecological-hygienic situation with the least time.

Locational measures of atmospheric air by this laboratory on the city motorways with the most intense motion (6 route observation posts) prove the presence of pollution in atmospheric air. Observations have shown that the following typical results: exceed of the utmost standards on nitrogen dioxide equaled 1,5 MPC one time concentration; on formaldehyde – 1,4 MPC one time concentration; on weighed substances – 3,15 MPC one time concentration on motorway of Kholodilnaya street. Studies of polluting substances in atmospheric air from car transport flows throughout the year showed exceeding of weighed substances and nitrogen dioxide during spring-summer period (May, June, July, August) and autumn-winter period (September).

On the whole, measures of atmospheric air, taken with mobile laboratories at the studied city areas have shown that the highest indexes of harmful substances concentration are registered on territories that lay by motorways, and concentration

decreases as we move away from them. This evaluation is important for projecting and reconstruction of objects, planning micro-districts – making architecture-planning and constructive decisions.

Considering the situation in evaluating levels of atmospheric air pollution, it is important to consider a condition of it in the city on specific constructing district territories. To specify actual condition of the atmospheric air according to polluting substances on such territories with minimal financial and laborious costs it is necessary to use the complex of information on emission sources. The quickest way is the calculative method, but it requires confirmation of calculative data by measure indications. This method allows us to evaluate maximum occasional and average concentration of polluting substances.

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