



REDUCTION OF THE SERVICE LIFE OF ASPHALT CONCRETE PAVEMENTS UNDER THE INFLUENCE OF VARIOUS EXTERNAL FACTORS

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ABSTRACT

The article provides a brief description of the conditions for using automobile roads in the Republic of Uzbekistan. Additionally, recommendations are given for improving the current regulatory documents.

Highways play a crucial role in the economic development of our country. Nearly 85 percent of cargo transportation is carried out by road transport. The total length of public roads in Uzbekistan is 42,371 kilometers. 97% of their surface is covered with mixtures consisting of mineral and organic binding materials [1].

In the process of globalization of production processes, the growth of motorization is inevitable, with increases in load capacity, speed, and other indicators. As a result, higher requirements are imposed on roads for heavy-duty vehicles.

Currently, roads in Uzbekistan are being designed to accommodate an axle load of 13 tons. In practice, these loads often exceed the limit, especially during the summer months when rising air temperatures decrease the resistance of asphalt concrete pavements to loads from trucks. Consequently, in spring, the rising groundwater level weakens the roadbed's strength, while in summer, the pavement's strength decreases. In both cases, the load-bearing capacity of asphalt concrete is significantly affected by heavy vehicles. To address these issues, it is necessary to study the growth of cargo flow volumes and their optimization, the diversity of natural conditions in different regions, as well as the interrelationship of these factors [3].

In summer, when air temperatures rise to 40°C (sometimes reaching 50°C), the road surface heats up to 60-70°C, and in some cases even higher. As a result, the pavement takes on a sticky, plastic consistency, forming longitudinal and transverse waves (according to GOST 22245, the softening point of viscous bitumen is 33-52°C) [2].

The demand for materials and funds allocated for road construction, repair, and maintenance is increasing year by year. Skillful use of each structural element leads to extended service life and preservation of the pavement in good condition [3].

In practice, the causes of premature road deterioration have not yet been fully studied or confirmed by research. The complexity of such research lies in the diversity of road operating conditions, the main factors being the variability of traffic flow composition and constant changes in natural and climatic conditions [3].

The main challenges in highway operation are preventing premature road failure, overcoming these issues, and developing scientific and practical solutions that ensure reliable, fault-free performance.

According to GOST 9128, asphalt concrete pavement testing is conducted at +50°C, but for our climate, it should be performed at a temperature of at least +70°C. This indicates that the resistance to displacement does not meet requirements; consequently, the strength of the road surface is not ensured, and the structures do not provide the required reliability [3, 4].

Based on the aforementioned, it can be concluded that under weather conditions typical for our climate, it is essential to maintain the coating's resistance to shear and prevent various deformations. It is necessary to develop standards for materials, and it is advisable to establish a temperature threshold of +60 °C and perform calculations based on this.

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