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# FOREIGN EXPERIENCE IN THE CONSTRUCTION OF HIGHWAY PAVEMENT

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| ABSTRACT | KEYWORDS |
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| This article studies the foreign experience of highway pavement construction in developed countries and aims to adapt it to our local climatic conditions in order to bring road infrastructure to a new level. | drainage, asphalt concrete, cement concrete, polymer, autobahn, deformation, soil, infrastructure, smart road, seismic, monitoring, structural layer, technology. |

## Introduction

In today’s era of globalization, transport infrastructure—especially highways—plays a crucial role in the economic development of every country. The quality of roads directly affects trade between countries, logistics, tourism, and the daily mobility of the population. In road construction, the main attention is given to the durability of pavement structures, long service life, environmental safety, and economic efficiency. Therefore, developed countries widely use modern technologies and innovative materials in highway pavement construction.

## Discussion

A road pavement is the main structural layer that distributes loads from vehicles evenly to the subgrade and ensures the operational performance of the road. Each country constructs road pavements based on its natural climate conditions and economy. Every developed country has its own specific methods and requirements for pavement construction. According to the experience of developed countries, the following main requirements are imposed on road pavements:

High strength and durability.
Adaptability to various climatic conditions.
Water resistance.
Efficiency of drainage systems.
Environmental safety.

Low maintenance and service costs.

Studying the experience of developed countries in road pavement construction is considered one of the most appropriate approaches for us. At present, we will analyze the advanced, modern, and highly effective experiences of countries such as the USA, European countries, Japan, South Korea, and China in highway pavement construction.

**Analysis and Results**

**USA experience:**

The United States is one of the countries that widely applies scientific approaches and technological innovations in highway pavement construction. In the USA, asphalt concrete and cement concrete pavements are widely used. In particular, cement concrete roads are distinguished by their long service life. One of the key aspects of the US experience is the use of modified asphalt concrete. Asphalt with polymer additives does not soften at high temperatures and is less prone to cracking in cold conditions. In addition, the use of recycled materials is widely implemented. This is environmentally beneficial, reduces environmental pollution, and also decreases construction costs.

**European countries' experience:**

In Europe, particularly in Germany, France, the United Kingdom, and the Netherlands, quality and environmental safety are given top priority in pavement construction.

**Germany experience:**

In Germany, the famous "Autobahn" highways are characterized by cement concrete pavements. These roads can withstand heavy loads and serve for 30–40 years without major repairs. In addition, highly deformation-resistant materials are used, drainage systems are well designed, and continuous road monitoring is implemented.

**France experience:**

The French experience shows a combination of quality, environmental protection, and economic efficiency in road pavement construction. In France, road pavements are designed based on recommendations from research institutions such as LCPC (now IFSTTAR) and SETRA. Advanced materials, modern technologies, and strict quality control systems ensure long service life of French roads.

**Netherlands experience:**

The distinctive feature of pavement construction in the Netherlands is the use of noise-absorbing asphalt, which is widely applied across the country. This type of asphalt concrete significantly reduces traffic noise in urban areas.

**Japan experience:**

Japan is located in a highly seismic region; therefore, earthquake resistance is a key criterion in highway pavement construction. Elastic and multilayer pavement structures are used, and special additives are added to asphalt concrete to make it vibration-resistant. Japan also has highly advanced

drainage systems that prevent road damage during heavy rainfall and floods. Scientific approach is a top priority. Japan is a global leader in Smart Road technologies, where sensors are installed in roads to monitor load and temperature.

**South Korea experience:**
South Korea actively uses digital technologies in road construction. All construction processes are managed through specialized software, which improves accuracy and quality. Another advantage is the widespread use of fast-setting asphalt concrete, which significantly reduces construction and curing time.

**China experience:**
China has extensive experience in road construction due to its large-scale infrastructure development and high transport demand. The country applies industrial-scale approaches in road construction. Innovative concrete mixtures, fiber-reinforced materials, and recycled resources are widely used, which increases service life and operational efficiency. This also contributes to the economic growth of the country.
Studying foreign experience and adapting it to national conditions plays an important role in developing the highway system of Uzbekistan. The application of these technologies helps improve road quality, reduce maintenance costs, and ensure transport safety. Considering climatic conditions, soil types, and economic capabilities, the use of polymer-modified asphalt concrete, cement concrete pavements, and efficient drainage systems is highly recommended.

**Conclusion**
Foreign experience in highway pavement construction is based on scientific approaches, modern technologies, and environmental responsibility. The practices of the USA, European countries (Germany, France, the Netherlands), Japan, South Korea, and China demonstrate a strong focus on pavement durability, long service life, high traffic capacity, and safety. Studying and adapting these advanced experiences to national conditions can significantly improve road quality and transport safety. It is important not to directly copy foreign practices, but to adapt them to local climate conditions, economic capabilities, and existing infrastructure. By gradually implementing foreign experience in road pavement construction, integrating it with local scientific research, and improving national standards, it is possible to develop modern, durable, safe, and long-lasting highways in Uzbekistan.

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