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TOP 10 TRANSPORT TECHNOLOGIES AND INNOVATIONS IN 2025 FOR UZBEKISTAN

Mamasalieva Mukaddas Ibadullaevna
Associate Professor at Islam Karimov Tashkent State Technical University, Tashkent, Uzbekistan
E-mail: mamasaliyevamuqaddas@gmail.com
ORCID ID: 0000-0002-9175-905X
Science ID: MTN-0525-0086

Abstract. *The article provides an overview of the ten most significant transport technologies that will determine global trends in 2025 and are of practical value for the development of Uzbekistan. It analyses the prospects for introducing innovations, taking into account national characteristics, with a focus on expanding the fleet of electric vehicles and the use of gas motor fuel. It considers issues related to the digitalisation of public transport and the creation of intelligent urban traffic management systems. The material contains practical recommendations for modernising the republic's transport infrastructure, aimed at improving energy efficiency, digitising public transport, environmental safety, introducing intelligent traffic management systems, and optimising logistics processes in the current economic conditions.*

Keywords: *transport innovations, electric vehicles, smart roads, digitalisation, drones, transport modernisation, sustainable transport, localisation of production, prospects for the automotive industry in Uzbekistan.*

ТОП-10 ТРАНСПОРТНЫХ ТЕХНОЛОГИЙ И ИННОВАЦИЙ В 2025 ГОДУ ДЛЯ УЗБЕКИСТАНА

Мамасалиева Мукаддас Ибадуллаевна
Доцент, Ташкентский государственный технический университет имени Ислама Каримова, Ташкент, Узбекистан

Аннотация. *В статье представлен обзор десяти наиболее значимых транспортных технологий, определяющих глобальные тренды 2025 года, представляющие практическую ценность для развития Узбекистана. Анализируется перспективы внедрения инноваций с учетом национальных особенностей, акцентируя внимание на расширении парка электромобилей и использовании газомоторного топлива. Рассматриваются вопросы цифровизации общественного транспорта и создания интеллектуальных систем управления городским трафиком. Материал содержит практические рекомендации по модернизации транспортной инфраструктуры республики, направленные на повышение энергоэффективности, цифровизации общественного транспорта, экологической безопасности, внедрению интеллектуальных систем управления дорожным движением, а также оптимизацию логистических процессов в современных экономических условиях.*

Ключевые слова: *транспортные инновации, электромобили, умные дороги, цифровизация, дроны, транспортная модернизация, устойчивый транспорт, локализация производства, перспективы автопрома Узбекистана.*

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2025-YILDA O‘ZBEKISTON UCHUN ENG YAXSHI 10 TA TRANSPORT TEXNOLOGIYALARI VA INNOVATSIYALARI

Mamasaliyeva Muqaddas Ibadullayevna
Islom Karimov nomidagi Toshkent davlat texnika universiteti dotsenti, Toshkent, O‘zbekiston

Annotatsiya. *Maqolada 2025 yildagi global tendentsiyalarni belgilaydigan va O‘zbekistonni rivojlantirishda amaliy ahamiyatga ega bo‘lgan o‘n ta eng muhim transport texnologiyalari sharhlandi. U milliy xususiyatlarni hisobga olgan holda innovatsiyalarni joriy etish istiqbollarini tahlil qiladi, elektr transport vositalari parkini kengaytirish va gaz dvigatelli yoqilg‘idan foydalanishga e’tibor qaratadi. Shuningdek, jamoat transportini raqamlashtirish va aqlli shahar transport boshqaruvi tizimlarini yaratish masalalarini ko‘rib chiqadi. Materialda respublikaning transport infratuzilmasini modernizatsiya qilish bo‘yicha amaliy tavsiyalar keltirilgan bo‘lib, ular energiya samaradorligini oshirish, jamoat transportini raqamlashtirish, ekologik xavfsizlikni ta’minlash, aqlli transport boshqaruv tizimlarini joriy etish va hozirgi iqtisodiy sharoitda logistika jarayonlarini optimallashtirishga qaratilgan.*

Kalit so‘zlar: *transport innovatsiyalari, elektr transport vositalari, aqlli yo‘llar, raqamlashtirish, dronlar, transportni modernizatsiya qilish, barqaror transport, ishlab chiqarishni mahalliylashtirish, O‘zbekistonda avtomobil sanoatining istiqbollari.*

Introduction. Modern transport systems are undergoing rapid transformation. In 2025, the global industry is focusing on sustainability, digitalisation and environmental friendliness. For Uzbekistan, located in the centre of Eurasia and with a growing transport load, the introduction of advanced technologies is particularly relevant. They will improve the quality of transport, improve the environmental situation and strengthen the country's logistical role as a technological re-equipment of the industry and production [5].

Automotive manufacturing is the youngest industry created in our independent state. In an unprecedentedly short period of time, a unique car manufacturing facility has been created and is successfully developing in our country. Today, this new industry is becoming a powerful driver of development for the entire economy of Uzbekistan [4].

Materials and methods. The main problem in Uzbekistan's transport sector remains the high load on roads, wear and tear on vehicles, and the insufficient environmental friendliness of the fuel used. The growth of the vehicle fleet in Uzbekistan increases the load on the environment, making air pollution one of the most acute problems. The modern automotive industry is undergoing a period of profound change. Traditional internal combustion engines are being replaced by hybrid and electric technologies designed to reduce dependence on fossil fuels, lower pollutant emissions and improve operational safety [8]. The Republic of Uzbekistan, which is actively modernising its transport and industrial sectors, considers the introduction of hybrid technologies to be a strategic direction capable of improving the environmental situation and creating new opportunities for industrial growth [3].

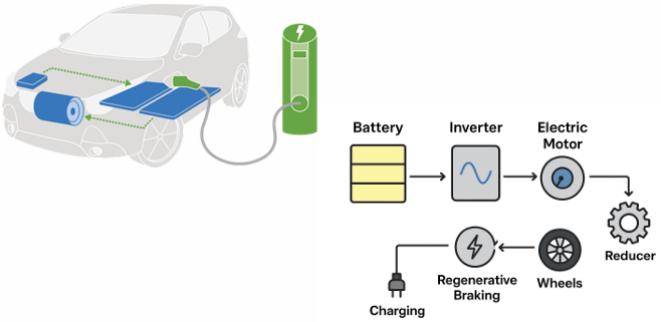

Fig.1. Electric vehicle charging system.

At the same time, the country has great potential for the introduction of new technologies, including the electrification of transport, the development of intelligent traffic management systems, and the digitalisation of logistics. The research method is based on an analysis of international experience, reports from global organisations (IEA, World Bank), and strategic

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documents of the Republic of Uzbekistan on the development of transport infrastructure. The study was prepared using a comparative analysis of global innovations, reports from international organisations, and national strategic programmes in the field of transport.

Research results and discussion. Electric transport (electric buses, electric cars) – introduction of electric public transport in large cities. Electric buses have already begun to be introduced in Tashkent and Samarkand. This reduces dependence on traditional fuels and improves the environment.

Gas-powered transport (CNG/LNG) – use of natural gas as a transitional environmentally friendly fuel. Thanks to its own natural gas reserves, Uzbekistan can actively develop a fleet of environmentally friendly gas-powered buses and trucks.

Smart public transport – digital applications, electronic tickets and GPS navigation. Digital route monitoring systems, mobile applications and electronic tickets improve passenger convenience.

Intelligent transport systems (ITS) - smart traffic lights, sensor systems and traffic control. The introduction of ‘smart traffic lights’, sensors and cameras reduces traffic jams and improves safety. [1,2]

Autonomous shuttles and taxis – pilot projects for tourist cities. Pilot projects involving driverless vehicles can be implemented in tourist cities, which will increase their attractiveness.

Railway electrification - development of high-speed and environmentally friendly transport. Continued electrification and the launch of new high-speed routes (such as Afrosiyob) strengthen the country's position in regional logistics.

Drones for logistics and agriculture - delivery of goods to hard-to-reach regions. The use of drones improves the delivery of goods to hard-to-reach regions and increases the efficiency of the agricultural sector [6].

Eco-friendly freight transport – multimodal schemes and energy-efficient trucks. The use of multimodal schemes (rail + road transport) and economical trucks reduces costs and emissions.

Smart roads and toll motorways – introduction of non-stop payment and road monitoring systems. Contactless payment and road condition monitoring systems improve the quality and safety of road infrastructure [7].

Air mobility (eVTOL) – long-term prospects for the tourism industry. By the 2030s, it may be possible to use electric air taxis on tourist routes (Tashkent - Charvak, Tashkent - Samarkand, Tashkent-Khiva, Samarkand-Bukhara, Termez-Kokand).

Each of these destinations has its own degree of applicability and time horizons for implementation. The most promising in the short term (until 2025–2030) are electric vehicles, gas-powered transport, ITS and the digitalisation of public transport [5]. In the long term, air mobility and autonomous transport will become priorities.

Conclusion. Thus, transport innovations in 2025 open up broad prospects for Uzbekistan. The priority areas are the development of electric transport, the use of natural gas as an environmentally friendly fuel, the digitalisation of public transport and the introduction of intelligent traffic management systems. In the long term, drones and air mobility are of particular interest. The timely introduction of these technologies will enable the country to strengthen its position in the region, improve the quality of life of the population, and reduce the environmental impact.

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