In general, the principle of operation of an electric car is very similar to that of a traditional car with an internal combustion engine, except that instead of an internal combustion engine, an electric motor is used in an electric car, and instead of gasoline or diesel fuel, electric energy from batteries is used.

The benefit of using electric cars is their more environmentally friendly nature. They do not emit exhaust gases into the atmosphere, which are the main cause of air pollution in cities. In addition, the use of electric cars can reduce fuel costs, as electricity is cheaper than gasoline or diesel fuel.

Electric cars are now used for both private and commercial transportation. They are also used in racing and other sporting events that involve automotive technology. However, electric cars have certain limitations compared to cars with an internal combustion engine (ICE). For example, they may have a shorter range and longer charging times, which makes them less convenient for long trips. Also, the batteries of electric cars have a limited lifespan, after which they need to be replaced, which can be costly.

So, while electric cars are a potentially useful technology for protecting the environment and saving resources, they still have their limitations and challenges that require further development and improvement.

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OVERVIEW OF THE GENERAL APPROACH TO THE CONCEPT OF SUSTAINABLE URBAN MOBILITY

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Sustainable urbanization is widely recognized as a key global challenge of the 21st century. Traffic congestion, air pollution, safety and noise pollution are examples of common problems in European cities. Apart from the direct impact on the environment, urban transport also affects social development, social exclusion and accessibility for people with reduced mobility.

To address these challenges in Europe and ensure competitive and resource-efficient urban mobility, the European Commission published the Urban Mobility Package in 2013. Within this package, Sustainable Urban Mobility Plans (SUMPs) are central to addressing the challenges facing urban areas.

The definition of sustainability of mobility as such can be derived from the definition of sustainable development formulated by the UN Brundtland

Commission [1], which "meets the needs of the present generations without compromising the ability of future generations to meet their own needs." This definition includes three pillars – economic, environmental and social, the so-called triple bottom line.

The SUMP concept is not a rigid definition of what urban planning should be or a single approach to urban mobility planning. Rather, it is a set of guidelines that can be adapted to the specific characteristics of the urban area under consideration.

The SUMP is a strategic plan designed to meet the mobility needs of people and businesses in and around cities for a better quality of life. It is based on existing planning practice and takes due account of the principles of integration, participation and evaluation. The SUMP, in adopting a traditional planning concept, focuses on people rather than transport, and aims to improve accessibility and quality of life, including social equity, health and environmental quality, economic viability; preparation of SUMP stands for "Planning for People" [2].

The SUMP concept is based on the following principles [3]: planning of sustainable mobility throughout the "functional city"; cooperation across established boundaries;. involvement of citizens and interested persons; assessment of current and future results determination and implementation of long-term perspectives; comprehensive development of all types of transport; organization of control and assessment; guaranteed quality.

The development of SUMP is a complex and lengthy process. In preparation, defining goals and developing the plan itself takes as much time as its implementation. The appropriate point for the process of developing the SUMP is clear policy decisions about its development. At this stage, all available (human, institutional, financial) resources are analyzed for planning and creating appropriate work structures. Analysis is made of the mobility from the perspective of all modes of transport and relevant aspects of sustainability, using an appropriate set of current data sources. The final first area of the first phase is the completed analysis of the main problems and opportunities related to mobility in the entire functional urban area.

At the second stage, there is a determination of the strategic direction of the SUMP in cooperation with citizens and interested stakeholders. At the end of the second stage, the vision, advantages and goals are formed. Decision-makers must ensure that targets are ambitious, achievable, mutually agreed upon, widely supported by stakeholders and coherent with other policy areas.

At the third stage, the planning process moves from the strategic to the operational level. This stage focuses on activities to achieve the agreed goals and objectives. Here, the plan for sustainable urban mobility has been completed and its implementation has been prepared with a step-by-step plan of specific actions, most of the resources, the deadline and the executors.

The fourth phase focuses on the implementation of measures and related actions identified in the SUM, carried out through systematic monitoring, evaluation and communication. At this stage, actions are implemented.

Currently, some of Ukrainian cities have their own developed Sustainable Urban Mobility Plans. These include Ivano-Frankivsk, Poltava, Mykolaiv, Vinnytsia (Concept of Integrated Development), Zhytomyr, Podilsky District of Kyiv and Lviv. Kharkiv SUMP was not completed due to the beginning of the war. The creation of the SUMP remains an urgent task for Ukrainian cities as it is focused on increasing satisfaction in the mobility needs of the population, especially at the stage of reconstruction of the territory and the country after the war.

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MODERN DEVELOPMENTS OF ENGINEERING

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Engineering has become an essential component of modern society, with advances in technology and new developments in engineering driving innovation and progress in various industries. In recent years, modern developments in engineering have focused on enhancing sustainability, improving energy efficiency, and reducing environmental impacts. This paper presents a comprehensive review of the latest advancements in engineering, focusing on sustainable engineering, energy-efficient technologies, and smart engineering.

Sustainable engineering refers to the process of designing and developing technological solutions that meet the needs of society while minimizing their impact on the environment and ensuring the efficient use of natural resources. It is a multidisciplinary field that combines principles of engineering, environmental science, and social science to create solutions that are economically viable, socially acceptable, and environmentally sustainable.

The goal of sustainable engineering is to promote the development of technologies and processes that reduce the negative impact on the environment and