Today it is impossible to imagine Kharkiv without the underground system and its comprehensive effects. So, use of the subway is convenient, fast, and comfortable. Well-developed scheme best meets the need of transporting passengers to work, or community centers. The level of development of the underground, compared with other modes of urban transport, is significantly ahead. The rolling stock is outdated, but after the overhaul and modernization of both external and internal units and units, has a decent look. The work is done in the technical re-equipment and improvement of management systems work stations. It should be noted the interiors of the stations, which affects the fusion of engineering and art. The metro ensures complete safety of trains, the appropriate level of culture of service of passengers. We are constantly searching for ways to improve the efficiency and quality of rail subway.

So, the development of the city causes increase of population, which causes the need for urban electric transport. The level of development of transport affects the overall picture of the city. Well-developed transport system that stimulates the mobility of the population, which in turn leads to equalization of rates of economic growth and investment attractiveness of different areas that are interconnected, however, the increasing educational and cultural level of society. Therefore, urban electric transport is an integral part of city life.

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LIGTWEIGHT CONCRETE

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In our time concrete is the main construction material for building. More than a thousand kinds of various concrete and a great variety of special concretes with different complexes of properties are used nowadays.

Comparative simplicity and availability of concrete producing technology, a wide possibility to use local raw materials and wastes of industry and power engineering, low energy needs for production, reasonable price and a wide possibility

in incarnation of various architectural and construction solutions are the characteristics that guarantee a wide application of concrete in construction.

Many of the properties of concrete depend on its density, the value that is influenced by the density of the cement stone, the type of fillers and the concrete structure.

On the basis of density concrete is divided into:

• hard with the density of more than 2500 kg/ cub. m.;
• heavy - 2100 to 2500 kg/ cub. m.;
• lightweight concrete -1800...2100 kg/ cub. m.;
• light -500... 1800 kg/ cub. m;
• extremely light - less than 500 kg/ cub. m..

Using lightweight concrete with high operational properties is particularly relevant in our time.

One of the most effective methods is using the concrete with the density of 1800...2100 kg/ cubic meter, in which dense compact coarse and fine aggregates are replaced by the porous fillers. Due to this, a significant increase is achieved in the efficiency of using material, energy resources as well as labor cost.

Fillers are natural or artificial materials of a certain grain composition, which in a rationally prepared mixture in combination with a binder form concrete or mortar. They are responsible for up to 80-90 % of the total volume of the concrete and influence the technological properties of concrete mixtures and the quality of the hardened concrete. The cost of aggregates reaches 30-50 % of the cost of concrete and reinforced concrete structures, and sometimes even more.

Lightweight fillers have the best thermal properties, best fire resistance, reduced shrinkage, high strength with respect to the cycle of freezing and thawing, improved contact between aggregates and cement, increased elasticity, resulting in decrease in the formation of microcracks. Such characteristics as absorption of sound and buffing should also be added. High-performance lightweight concrete has no inclination to cracking, it is characterized by a high resistance to sliding and easily allows loading using pumping method.

For economic reasons use of lightweight concrete is the most effective in load-bearing structures of buildings and constructions of high-rise, foundation constructions as well as in large-scale structures for bridge building. This is especially actual for the regions where ground waters are too close to the surface and the weight of the building adversely affects its stability. Adaptation of lightweight concrete has allowed to avoid using complex foundations.

Lightweight concrete reduces the density of heavy concrete for 400-600 kg, i.e. approximately for 20%. This helps reduce the valve for 3-40% (depending on the series of buildings and constructions, their height and brand structures), significantly reduce the cost of base constructions, transport costs and the volume of the shuttering works in constructions of monolithic concrete. It should be noted that application of lightweight concrete instead of the traditional heavy one allows to achieve reduction of the construction’s cross-section, which leads to additional saving (due to reduction

in consumption of the concrete components, including cement). This saving is possible due to better thermophysical properties of lightweight concrete.

Thus, application of complex chemical aggregates offers an opportunity for saving due to reduction in the cycle of articles' heat treatment, including reduction of energy resources consumption, which is essential nowadays.

PERFORMENCE CHANGES IN PASSENGER TRAFFIC OF URBAN TRANSPORT AND METHODS OF THEIR RESEARCHING

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Indicators of transport work determine preferences and characteristics of various modes of transport. Some activities characterize transport possibilities, others allow consumers to evaluate and select the most appropriate alternative transport service.

The indicators allow to evaluate:

• the amount of the work, such as volume and range of transportation, passenger traffic, transport network density, transport mobility of the population, labor productivity, labor input;

• technical and operational characteristics such as carrying and traffic capacity, time and speed of delivery, flow rate of vehicles, quality keeping level;

• economic (cost) data and results, for example, tariffs and prices for transport services, cost of fixed assets, specific capital investments, traffic prime cost, profitability, cost of freight in transit, mass profit.

The primary task of the science of the city's transport system is to develop a standard methodology for predicting mobility to estimation terms. There are two possible approaches.

For long-term prognostication (urban development, master plan) should be based on socio-economic objectives of the city development - in this case, a "social norm" can be used which reflect the demands of the city residents , i.e. the taxpayer. Then, there is the starting point, namely, the mobility of the initial year, determined as the result surveys, and the final point, the given "normative" point, i.e. the mobility of the estimated period. These two points determine the overall development strategy of the city transport system. The ways to achieve the final ("normative") values of mobility, and, what is the most important, the pace of progress towards this value (versions development) and, consequently, the degree of satisfaction of the taxpayers' claims predetermined by the magnitude and dynamics of investments in the transport system, depending on the state of the city economy and behavioral patterns of the population.

Transport mobility of the population within the boundaries of the village leads to formation of passenger flows having different directions and power.