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THE ROLE OF TRAM SYSTEM IN THE LOGISTICS OF PASSENGERS FLOWS IN UKRAINE

Nazaretian Oleksandr

National aviation university, Kyiv

Academic Supervisor – Kateryna Molchanova, PhD in Economics, Associate Professor

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Trams are railway-based transportation vehicles which are integrated into public transport structure. The benefits of tram systems are bigger passenger capacity than in road transport, the cheaper operation and faster accessibility for passengers in comparison with subway. Ukraine has 18 tram systems which are various sizes and some of them play both strategic and symbolic roles in city transportation logistics.

In order to reduce the number of private car usage and decrease the level of air pollution levels in big cities, a big majority of developed countries are increasingly introducing and reviving tram systems, considered as environmentally sustainable, reliable and able to meet high mobility demands [1]. This mode of transport was firstly introduced in the middle of 19th century. The first horse-drawn tram appeared in Ukraine in Lviv in 1880. In Kyiv, an electric tram appeared even earlier, in 1892, and became the first electric tram on the territory of Ukraine and the entire Russian Empire at that time. The largest tram system in Ukraine now is located in Odesa, the total length of tram routes is 313.5 kilometers. The dynamics of passenger transportation by trams is presented in Fig. 1.

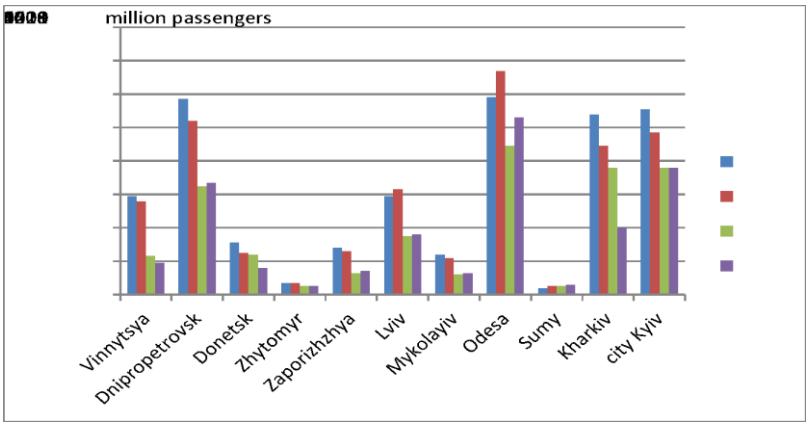

Figure 1. Passenger transportation by tram by region [2]

As can be seen from the graph, the volumes of transportation for 2018-2021 have decreased significantly, which is connected with the pandemic COVID-19. Due to active hostilities in 2022, the volume of transportation is expected to decrease further. We also note that the tram is inferior to

trolleybuses and the metro in the volume of passenger transportation. Thus, in 2021, the total number of passengers transported across Ukraine by trolleybuses was 594 million, by the subway - 483 million, and by trams - 398 million. To date, 12 tram systems operate in Ukraine, another 6 are located in the occupied territories or in the war zone. Almost all existing systems in Ukraine have morally old infrastructure, 95% of trams have ended their statutory service life and require replacement. A significant number of tram lines and power facilities need urgent major repairs or reconstruction of them. There is a major tram system in the capital of Ukraine Kyiv, the length of which is about 230 km overall, and it consists of 35 routes nowadays. During the time of foundation, Kyiv tram systems had the biggest influence in public transport system and logistics of the whole agglomeration, as it comprised not only passengers' transportation, but freight transportation too. A vital role plays tram transportation in public transport system of the most tourist attractive city in the country Lviv [3]. Note that this is the only transport system in Western Ukraine. The length of the system is approximately 86 km, and it involves 10 routes. One of the tram's features in Lviv that it plays not only a transport role but symbolic and tourist attraction roles too. The large carrying capacity of tram transport and the low cost of passenger transportation ensure that it maintains its leading role in medium and large cities. Tram lines are built on the periphery of cities to connect large industrial areas with residential areas. In addition, the tram serves other points of concentration of passenger flows (stations, stadiums, etc.). The carrying capacity of the tram line when operating trains with a capacity of 200-230 passengers reaches 12-14 thousand passengers per hour.

Conclusion

There are a lot of cities in Ukraine that own a tram system. However, due to the lack of investment this mode of transport is not attractive for the big majority of passengers including disabled or immobile people. Despite the great advantages of tram transport, its specific weight in transportation is constantly decreasing. Increased motorization of cities complicates the joint operation of tram and road transport on narrow city streets.

References:

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