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ANALYSIS OF INSTANTANEOUS VELOCITIES ON THE STREETS WITH HIGH RATE OF URBAN PUBLIC TRANSPORT

Today with increasing frequency raises the question about relevance of urban public transport, as alternative to private automobiles during the movement in cities, and reduction of time losses during its usage. There are exist different strategies for effective usage of urban public transport. But for their realization detailed research of the main characteristics of traffic flow is needed. Speed of movement is one of these characteristics, and it also is an objective function of traffic [1]. For this reason research on instantaneous velocities of vehicles is the task of prime importance during the analysis of urban public transport usage. Instantaneous velocity is the velocity of vehicle on concrete road section in certain recorded moment of time [1]. On speed of movement in traffic flows have impact different factors: traffic intensity, type and condition of road surface, weather conditions, and also qualitative composition of traffic flow that is rate of slow moving vehicles and urban public transport, as it is known that average technical speeds of trams and trolley-buses movement are quite low (20–25 km/h.). On the other side, private automobiles paly important role during the movement of urban public transport, which, in their turn impact speeds of urban public transport movement and create dangerous situations.

So, for determination of mutual influence of private transport and urban public transport, field research was carried out on three sections of streets with different number of lanes and different rate of urban public transport on them. For the research Patona and Vyhovskogo (from the intersection with Horodotska street to the intersection with Patona street) streets, Heroiv UPA and Horodotska (from the intersection with Ya. Mudrogo street to the intersection with Banderu street) streets, and also Stryiska (from the intersection with Naukova street to the intersection with Vernadskogo street) and

Naukova streets were chosen, and with accordingly one, two and three lanes in one direction in Lviv city. On Patona, Heroiv UPA and Naukova streets rate of urban public transport is higher and composes accordingly 18, 24 and 17%. On Vyhovskogo, Horodotska and Stryiska streets the percent of urban public transport in general structure of traffic flow composes accordingly 11, 14 and 12%. Based on research findings calculation of instantaneous velocities of vehicles was made and analysis of statistical data on each lane was carried out.

It is defined that amounts of instantaneous velocities correspond to normal law of distribution. Calculation results are described on figure 1 and figure 2.

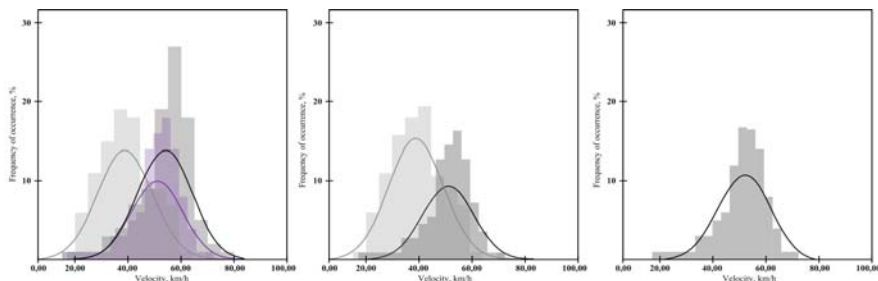


Figure 1 – Research results of instantaneous velocities in traffic flow depending on number of lanes on Naukova, Heroiv UPA and Patona:

— right lane; — middle lane; — left lane

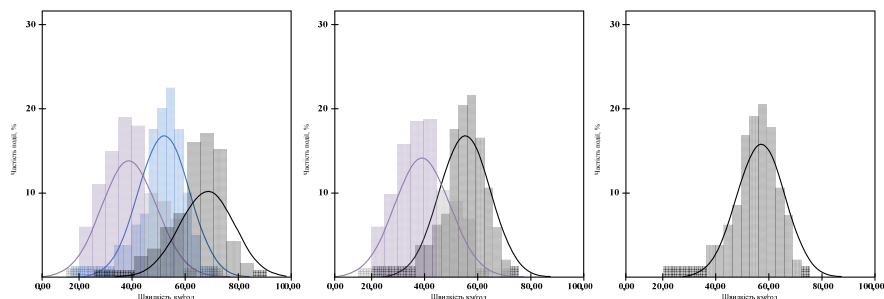


Figure 2 – Research results of instantaneous velocities in traffic flow depending on number of lanes on Stryiska, Horodotska and Vyhovskogo streets:

— right lane; — middle lane; — left lane

So, according to research results, amounts of velocities decrease with the increase of urban public transport rate. That is why, regardless to the number of lanes, priority to urban public transport (specifically arrangement of special

lanes for its movement) should be given on streets with the high rate of urban public transport in traffic flow composition.

REFERENCES

1. May, A.D. (1990), Traffic Flow Fundamentals, Englewood Cliffs, NJ: Prentice Hall.