Коефіцієнт варіації становив, $\gamma = 13,43\ \%$. Межі коливання цієї тривалості, $T_{СП\ MIN} = 26,89\ хв$, $T_{СП\ MAX} = 59,32\ хв$. Різниця між ними – 32,43 хв. (рис. 1).

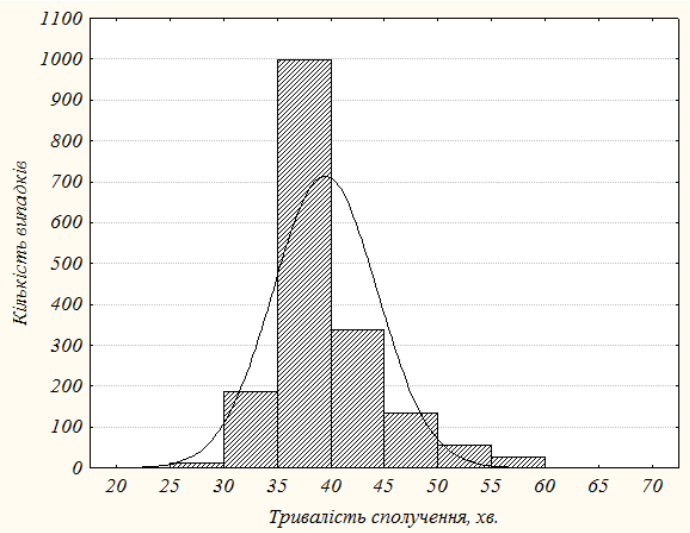

Рис. 1. Гістограма і теоретична крива розподілу тривалості сполучення на радіальному автобусному маршруті

Аналогічні характеристики знайдено для кожного робочого дня місяця й можна зробити висновок, що вплив на тривалість сполучення, перелічених на початку тез чинників, істотний. Очевидно, що не для усіх ділянок маршруту: для окремих з них, на яких не було заторів, графік руху дотримувався, на інших з заторами автобуси прибували на зупинки із запізненням.

Наведені результати показують, що дослідження у цьому напрямку потрібно продовжувати, поширивши їх на такі маршрути, для яких на окремих ділянках є виділені смуги. Це дасть змогу порівняти їх з такими, де немає виділених смуг, і реально оцінити ефективність цього інженерно-технічного заходу для умов та режимів руху громадського транспорту по ВДМ м. Львова.

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ENVIRONMENTAL ASPECTS OF SMART TRANSPORT

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The main environmental aspects of transport are outlined. A brief review of various types of transport and their negative impact on the environment and proposed measures to reduce and eliminate this negative impact on human health. The main focus is on the introduction of the most environmentally friendly modern modes of transport and transport of the future.

Transport is not the only factor contributing to the pollution of the earth's ecosystem.

Emissions of industrial harmful substances into the atmosphere, especially from transport, have a negative impact on the ecosystem, in particular on the overall health of the entire society.

The average lead content in gasoline is 0.4 g / l, and after combustion of gasoline in internal combustion engines, 75% of lead is thrown with exhaust gases into the air. Theorem has investigated that even in Austria, lead emissions from road transport and paint and varnish and other industries make up 20 thousand tons per year. It has also been investigated that in 2020, for every thousand Kiev residents will have 300 cars, which will emit about 110 thousand tons of harmful substances per year. Moreover, automobile emissions are concentrated in the surface layer of air (0.5-1.5 m from the surface of the earth, precisely in the area of our breathing).

It should be noted that domestic cars and trucks are environmentally much "dirtier" from western models, and worn out foreign cars that overflow our streets, spend more fuel on a 100 km path and much more pollute the environment. In general, a network of highways and railways occupy large areas of land that could be used to grow crops or forest plantations. For example, for the laying of the easiest road of 4 m. wide, every 1-2,5 km of track should cut about 1 hectare of forest, and road enclosures often cause groundwater flooding and waterlogging of adjacent areas along roads.

The most effective measures and their effectiveness in terms of reducing the negative impact of road transport are shown on the Table 1

Table 1

The most effective measures

Effective measures	Efficien cy,%
Repair, reconstruction, maintenance of roads in the normal state	10 – 20
Unloading of highways through redistribution oftraffic flows within the city, differentiation and specialization of highways	15 – 30
Transfer of transit traffic on the bypass highway	10 – 15
Use of environmentally friendly fuel	10 – 30
Construction of self-regulated crossings	5– 10
Introduction of flexible traffic control systems ("Green Wave")	10 – 15
Automated traffic control systems	15 – 20
Building solutions at different levels	15 – 20
Improvement of city planning structure, development of SRN, consolidation of neighborhoods	10 – 15
Improvement of street parameters in plan and longitudinal profile	5 – 10

Electrification will play a decisive role in the transition to a cheap and free transport system in the future. However, the current battery technology technology needs to be substantially refined to meet the current requirements for electric vehicles, buses, heavy trucks and other vehicles and carriers themselves.

Consequently, the use of electric vehicles, electric buses, electric motors, electric gyroscooters, electric motors, mono wheels, electric and solar aircraft and ships, rail trains and other vehicles using solar energy is much more environmentally friendly and cheaper and easier to operate.