Таблиця 2. Оптимальні параметри для заданого критерію виходу продукції

	Концентрація продукту на виході	Витрата плаву карбаміду	Витрата води	Витрата перегрітої пари	Витрати пари	Температура пари
Еталонні значення	2 %, 7 %	3577	190	935	1926	110
Завдання на оптимізацію (концентрації) і оптимальні значення регульованих параметрів	1 %, 1 %	3444	268	1099	2266	127

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CHARACTERISTICS OF TRAFFIC FLOW COMPONENTS

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ОСОБЕННОСТИ ТРАНСПОРТНЫХ КОМПОНЕНТОВ ПОТОКА

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Resume

Definitions of traffic flow components are presented, including ratios and practical application models, which provide a basis for studying the "behavior" of individual vehicles moving in a common flow.

The theory of traffic flows is one of the newest theories in the field of traffic organization theories. But, although this field has been introduced recently, with its help substantial results have been obtained.

***Keywords**: traffic flows, intensity of the movement, average temporary speed.*

Резюме

Определения транспортных компонентов потока представлены, включая отношения и модели практического применения, которые обеспечивают основание для изучения «поведения» отдельных транспортных средств, перемещающихся в общий поток

Теория транспортных потоков – одна из новейших теорий в области транспортных организационных теорий. Но, хотя эта область была недавно введена, с ее помощью были получены, существенные результаты.

***Ключевые слова**: транспортные потоки, интенсивность движения, средняя временная скорость*

INTRODUCTION

Comparatively useful results of the development of traffic flow theory are the establishment of ratios between such variables of traffic flows as: traffic intensity, speed and density. These ratios (results!) are widely used in many divisions of traffic organization.

As the disadvantages may be pointed out the backwardness of the application of the results obtained in the theory of traffic flows in practice, these backwardnesses are regrettable, however they are fully justified (honorable!). The lag is due to the fact that many specialists working on the problems of traffic flow theory are mathematicians, physicists or representatives of other disciplines and not specialists in the field of traffic organization. The engineers of the traffic organization in the case themselves are greatly indebted to these specialists, to whom they owe the greatest merit in the creation of theory. The traffic theorist is mainly concerned with the study of basic ratios ("why does this happen!"), While, as a traffic engineer, he is most interested in "what happens". This, in turn, explains the fact that time is needed before the results of theoretical research can be applied in practice. The results of traffic flow theory, with relatively rapid practical application, were obtained by traffic organization engineers. This theory has been developed to solve specific problems.

FORMULATION OF THE PROBLEM

Traffic intensity q – the intensity of the number of vehicles going on a given crossroad in a given unit of time is usually expressed as the number of vehicles per hour (veh/h), but relatively short intervals of time may also be used.

Traffic volume Q – is the number of vehicles going through the selected T crossing of the road in a given period of time. The amount of traffic is usually determined by the actual number of vehicles counted and is expressed as "vehicles".

Hourly traffic volume – the number of vehicles going on the selected crossroad per hour. Unlike intensity, the volume of motion can not be based on dimensions performed in a relatively short period of time,

Time interval h_t – time between vehicles going through a given crossroad in two sequences; Usually the time interval is depicted in seconds.

Mean time interval h_t – arithmetic mean of all measured time intervals h_t. The average time interval is expressed in seconds per vehicle and / or can be determined by the amount of traffic Q or its intensity q:

$$\overline{h_t} = \frac{3600\,T}{Q} = \frac{3600}{q}. \quad (1)$$

Average temporary speed *u_t* – the speed obtained by changing the speed of individual vehicles. Average temporal speed is expressed in kilometers per hour (km / h) or meters per second (mWh).

Travel time – the time spent by individual vehicles on the road section.

Total mileage *TT* is the sum of the journeys of all vehicles (or parts of vehicles with certain common characteristics) over a certain period of time.

Total Travel Time *TTT* – the total travel time of all vehicles to be discussed.

Average spatial speed *u_s* – the speed obtained when vehicles pass along the road in time. Average spatial speed is expressed in kilometers per hour (km / h) or meters per second (mWh). In any transport system, the average spatial speed for a given period of time is equal to the ratio of the total mileage of all vehicles in the system to the total travel time, i.e.

$$u_s = \frac{TT}{TTT} \leftrightarrow \frac{total\ mileage}{total\ travel\ time} \quad (2)$$

Density *k* – number of vehicles per kilometer of road, can also be used in areas of short road length. Density is determined by the entire width of the road (all lanes of traffic) and / or one lane of traffic.

Spatial interval *h_d* – the distance between the front bumpers of two vehicles moving one after the other at a given point of time. The spatial interval is depicted in meters.

Mean Spatial Interval (*h_d*) – mean value of *h_d* of all spatial intervals between vehicles on the road.

$$\overline{h_d} = \frac{1000}{k} = \overline{h_t} \cdot u. \quad (3)$$

Traffic flow is defined by three variables: intensity, speed, and density. The ratio between these three values is determined by the basic equation of traffic flow:

$$q = k \cdot u$$

Where q is the flow rate, auto / hour; *k* – flow density, auto / km; u is the flow velocity, km / h. The components of this equation are determined by one of three basic measurement methods.

Intersection measurements are measurements that are taken perpendicular to the direction of the road and at the intersection with the intersection of the full width of the road.

Section measurements are made on sections located between two sections of the road. The distance between intersections is indicated by *dx*.

System measurements are of two types:

1. In physical or geometric dimensions, a path is viewed as a system or something as a whole. The road element under consideration is separated by boundaries, and then the input and output characteristics of the system are measured at these boundaries.

2. A certain group of vehicles is also considered as a system. The measurements are taken for *N* vehicles according to their forward dimensions.

CONCLUSIONS

As a result of the development of traffic flow theory, realistic, practical models of traffic stopping have been developed to study traffic jams when entering and exiting traffic on highways, footpaths, near the STOP sign, and in narrow lanes. In addition, the theory of traffic flows laid the groundwork for an in-depth study of the "behavior" of individual vehicles moving in a common stream. Probabilistic models, based on this theory, have been developed as a useful tool used by traffic engineers in the study of various traffic situations. Another major application of traffic flow theory is considered to be modeling, already in the process of building more logical models, in itself representing the core of common models.

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АДАПТИВНА СИСТЕМА КЕРУВАННЯ СКЛОВАРНОЮ ПІЧЧЮ З ВИКОРИСТАННЯМ НЕЧІТКОЇ ЛОГІКИ

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АДАПТИВНАЯ СИСТЕМА УПРАВЛЕНИЯ СТЕКЛОВАРЕННОЙ ПЕЧЬЮ С ИСПОЛЬЗОВАНИЕМ НЕЧЁТКОЙ ЛОГИКИ

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ADAPTIVE CONTROL SYSTEM OF A GLASS FURNACE WITH FUZZY LOGIC

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В роботі розглянута система керування температурних режимів усіх зон регенеративної скловарної печі ванного типу з адаптацією параметрів її налаштування. Для адаптації використовуються алгоритми нечіткої логіки. Представлено результати порівняльного аналізу діючих систем керування та запропонованих.

***Ключові слова**: система керування, скловарна піч, нечітка логіка*