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SITUATIONS CREATED IN CITY TRANSPORT INFRASTRUCTURE BY DRIVERS DEPENDING ON THEIR AWARENESS LEVEL

Summary. The article deals with the influence of drivers transportation load depending on the drivers' information they created in transportation some of the situations are analyzed in the city infrastructure.

СИТУАЦИИ СОЗДАВАЕМЫЕ В ГОРОДСКОЙ ТРАНСПОРТНОЙ ИНФРАСТРУКТУРЕ ОТ ЗАВИСИМОСТИ УРОВНЯ ИНФОРМИРОВАННОСТИ ВОДИТЕЛЕЙ

Аннотация. В статье рассматривается влияние водителей на транспортную нагрузку в городской инфраструктуре. Кратко анализируются некоторые ситуации создаваемые водителями от зависимости их информированности.

1. INTRODUCTION

At present in the city transport infrastructure (CTI) the investigation of overcoming the additional loads which appeared in transportation is an actual problem. Population while of some service areas not providing maximal information, to go from one point to another one they use the transportation in the territory of city and create surplus transportation load [1, 2]. Also service areas having lack of information they serve people in a non-optimal degree. The satellite navigation systems can be useful for drivers [3, 4].

The densities mainly connected with lot of transportation means in the CTI. But drivers also influence this problem negatively. From this point of view let's look through some situations that can happen from a lack of information of drivers in the city area.

Let's note one starting and the other one ending two points look at the situations that drivers created between these points.

Let's assume that CTI is a network and it is described as G(N,L) graph. Here $N=\{n_1, n_2, ... , n_m\}$ the set of people who look for information, $L=\{l_1, l_2, ... , l_n\}$ is the set of roads while getting important information. While investigating the additional loads originated information we observe happening of different circumstances. Look at the special case which is described in fig. 1.

Here, B_j – is the objects which are originated which information and j=1,m. Let's assume that the driver must move from point A to B in the city and the driver knows city well, then no lack of information. Therefore he reaches from the point A to B by the shortest way, namely the moving car doesn't create additional load in transportation infrastructure. The way the driver moved in general will be expressed with the following:

$$L_{ij} = L_{important(i,j)} + L_{surplus(i,j)} \; ; \; i = \overline{1,n} ; \; j = \overline{1,m} .$$

Thefirst case

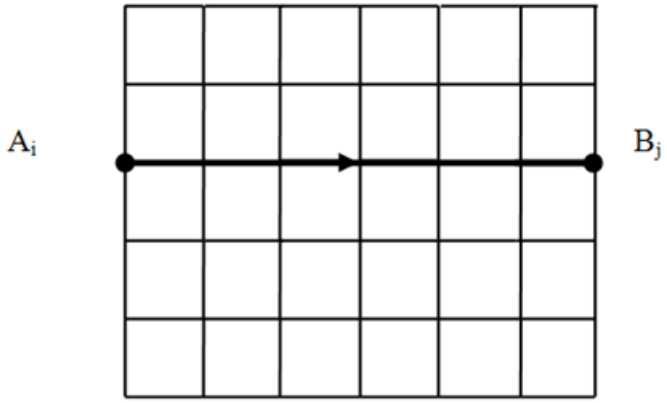

Fig. 1. Descripion of the frist case
Рис. 1. Описание первой ситуации

In the frist case the going direction will be

$$L(A_i, B_j) = L_{important}(A_i, B_j) + L_{surplus}(A_i, B_j) \quad (1)$$

Being the informed driver

$$L_{surplus}(A_i, B_j) = 0 \quad (2)$$

$$L(A_i, B_j) = L_{important}(A_i, B_j) \quad (3)$$

will be.

$L(A_i, B_j)$ – A and B the distance between these points, $L_{important}(A_i, B_j)$ - A and B the improtant distance between these, $L_{surplus}(A_i, B_j)$ - A and B is the additional (surplus) distance between these points.

As you see in this case there is no additional distance, the distance between point A and B is an important distance. Naturally, being minimum of the important distance will reduce the transportation load once more.

The problem is to determine the informatic parameter before moving the way of $L_{important}(A_i,B_j)$ and really the minimum to be the important way.

$$L_{important}(A_i, B_j) = \min_{important} \left\{ L_{important}(A_i, B_j) \right\} \quad (4)$$

Look at the other case. In this case it is supposed that the driver knows the city well, but he has not enough information about B point, namely, the information is less. Therefore he reaches from the A to B point moving a long distance. The distance between A and B points in the first case differs more than the distance between A and B points in the second case. In other word, there is additional load in the transportation infrastructure of the city. The way that driver has gone will be expressed as the following:

$$L_{surplus}(A_i, B_j) = L_{important}(A_i, B_j) - L(A_i, B_j) \neq 0 \quad (5)$$

As you see in this case the additional distance is seen clearly. The distance between A and B points is the additional distance. In order not to be additional distance or to fall down it to minimum it is nesessary to overcome the lack of information.

Let's assume that driver wants to use any service. Driver knows the place of introducing objects of this service but concretely he has no information about the object, especially about the information he looks for. That's way he has to drive to the service objects in order to find what he seeks. Sometimes he gets the service after driving to all possible objects and moving a long distance. And sometimes he

can't find what he looks for in any object, and even the service is not in the same object. Then the way he has gone is considered additional. As a description of this process if we look at fig. 3, we shall see that the driver starts form the point A, is in B_1, then in B_2, objects, not finding the service he looks for starts to the point B_3 and finds the same service there. If the driver knows that the service is in the point B_3 objects he would not go such a long way and he will not create an additional load in the transportation of the city infrastructure. In this case will be:

$$L_{surplus}(A,B_3) = L_{important}(A,(B_1,B_2,B_3)) - L(A,B_3) \qquad (6)$$

The second case

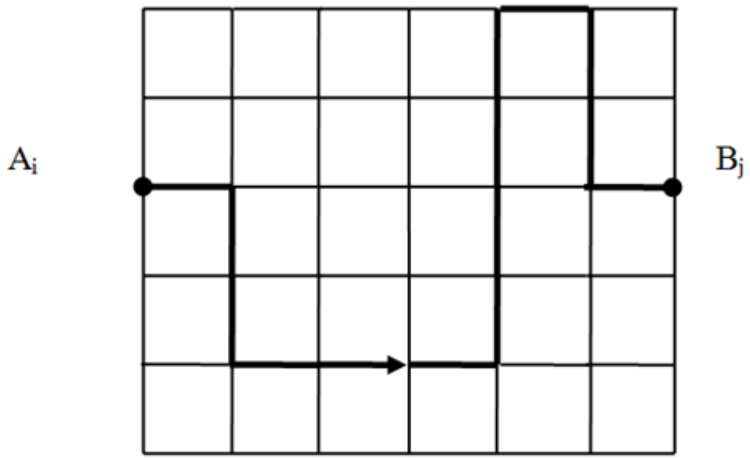

Fig. 2. Descripion of the second case
Рис. 2. Описание второй ситуации

The third case

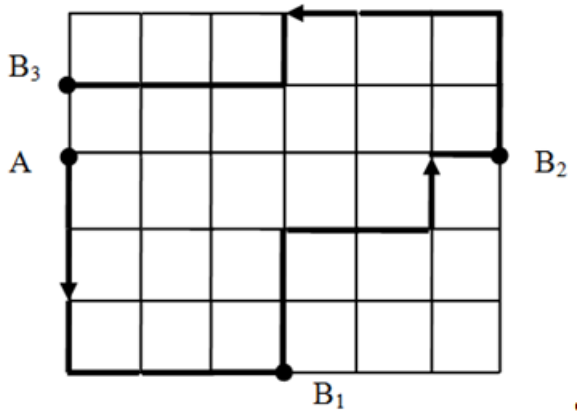

Fig. 3. Descripion of the third case
Рис. 3. Описание третьей ситуации

Though he gets to where he wanted for in the point B_3, actually the way he has gone $L_{important}$(A, B_1, B_2, B_3) in an additional load. If the driver was informed he would go straight from point A to point B3 and wouldn't have created additional load.

The fourth case

Differing from other big cities in Baku are held a lot of wedding parties and mourning ceremonies during the day. Wedding ceremonies are being in rush hours it is seen that how much is the transportation load is the city. In this sphere the lack of information also is seen. Though there is information on invitation cards, it is inevitabe from being additional transportation load. For the reason

that drivers ingnoring the places of ceremonies they circle. As a result both according to the general trajectory and stopping and asking the way create an additional load.

In other case while looking for the places of ceremonies and choosing they meet with the lack of information. Approximately the same things happen. This creates additional transportation load, too. Having more such ceremonies and enough number of the same no information strike seriously to the city transportation infrastructure.

2. RESULTS

So the factor of driver which influences to the creation of additional transportation load in the city transportation infrastructure being shortly analysed, has been dealt with different cases. The investigations show that the lack of information of drivers influences negatively to the transportation load, too. To overcome these cases adjoining the application of different new information technologies, approaching the problem individually it is necessary to inform drivers in a very positive way. Drivers must use special devices in their cars. This carries out the investigation in the necessary direction, too.

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