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

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**Summary**: The article deals with the influence of drivers on transportation load in the city infrastructure. Some situations created by drivers depending on their awareness level is briefly analyzed.

***Introduction***

At present, the investigation of overcoming the additional loads occurring in transportation is an actual problem in the city transport infrastructure (CTI). While not being provided with maximal amount of information by some service areas, population use the transportation on the territory of city to go from one point to another in order to obtain services and create surplus transportation load [1,2]. Also, due to lack of information, service areas are rendered to population on a non-optimal level.

The densities in CTI are mainly connected to a large number of transportation means [3,4]. But drivers also influence this problem negatively. Considering abovementioned, let's review some situations that can occur due to the lack of information of drivers in the city area.

Let's mark two points as one start and one end point, look at the situations that drivers create 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 searching for information, $L=\{l_1, l_2, .... , l_n\}$ is the set of roads until obtainment of important information. While investigating the surplus loads with informational origin, we observe occurrence of different events. Let's have a look at the special case which is described in fig.1.

***The first case***

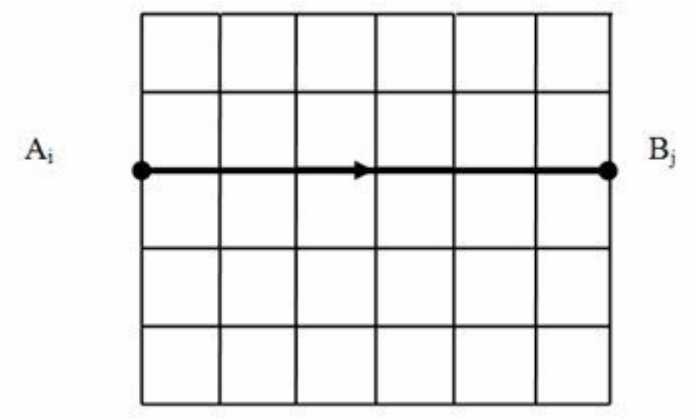


Fig. 1. Description of the first case

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

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

In the first case the overcome road 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.

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

As seen, in this case there is no additional distance, and the distance between A and B points is important distance. Naturally, being minimum of the important distance will reduce the transportation load one more.

The set issue is to determine the informatic parameter before overcoming the distance of $L_{important}(A_i,B_j)$ and actually reduce the important way to minimum.

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

Look at another case:

***The second case***

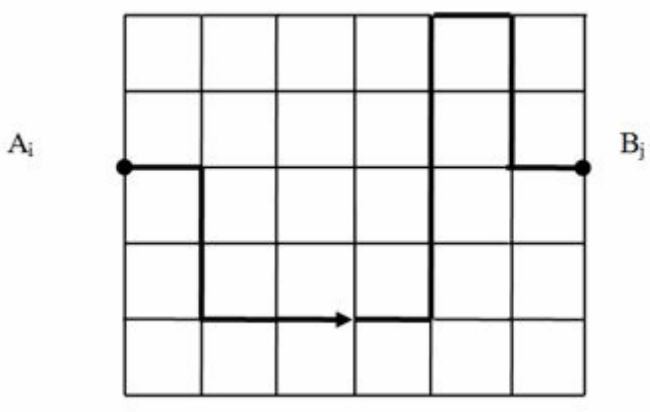


Fig. 2. Description of the second case

In this case it is supposed that the driver knows the city well, but he doesn't have sufficient amount of information about point B, namely, there is a lack of information. Therefore he reaches from the point A to point B by overcoming a long distance. The distance between A and B points in the first case differs from the distance between A and B points in the second case. In other words, there is an surplus load in the transportation infrastructure of the city. The distance that diver has overcome 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 necessary to overcome the lack of information.

***The third case***

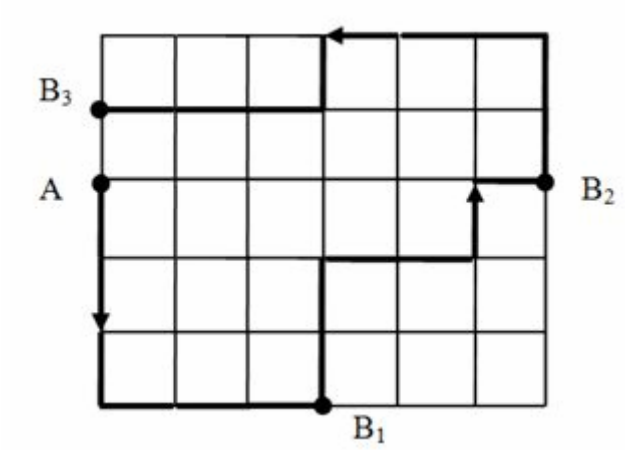


Fig. 3. Description of the third case

Let's assume that driver wants to use any kind of service. Driver knows the location (object) of rendering of this service, but concretely he has no information about the object, especially about the service field he is searching for. For this reason, 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 overcoming a long distance. Sometimes, he can't find what he looks for in any object, and even the service is not available at the same object. This way, the distance he has overcome is considered as additional. As a description of this process, if we look at fig. 3, we will see that the driver starts from the point A, is moved to point $B_1$, then to point $B_2$, not finding the service he looks for, he moves on to the point $B_3$ and finds that service there. If the driver knows that the service is at the point $B_3$ object, he will not overcome such a long distance and he will not create a surplus load in the transportation infrastructure of the city. In this case:

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

Although he obtains the searched for information at the point $B_3$, actually the distance he has overcome $L_{important}(A, B_1, B_2, B_3)$ in a surplus load. If the driver was informed he would move straightly from point A to point $B_3$ and wouldn't have created a surplus load.

***The fourth case***

Unlike other big cities, a lot of wedding parties and mourning ceremonies are held in Baku during the day. As the wedding ceremonies are being held during rush hours, the large amount of transportation load is the city is apparent. The lack of information in this sphere is also visible. Although there is information on invitation cards, surplus transportation load iss inevitable.

For that reason, drivers reach the destination where ceremony is held by inquiring several points on his way. As a result, both according to the general trajectory and stopping for inquiries, he creates surplus load.

In other case, while searching for locations where ceremonies are held and making choices, they face lack of information. Approximately same situation occurs, which creates surplus transportation load. A great number of such ceremonies, sufficient number of such ceremonial venues and lack of information seriously damage the city transportation infrastructure.

**Conclusion**

So, the driver factor influencing the creation of surplus transportation load in the city transportation infrastructure is being shortly analyzed, different cases are reviewed. Conducted researches demonstrate that, the low level of driver awareness negatively affects the transportation load. In order to prevent such situations, it is necessary to apply information technologies, as well as raise the awareness level of drivers to maximum by approaching this issue individually. Primarily, drivers engaged in rendering services must know city well, and use special devices on board of the vehicle using existing systems. Conduction of researches in field is necessary as well.

**References**

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