ISSN NO: 2770-4491
Date of Publication:30-11-2022

Analysis of Road Conditions Affecting Transport Flow Using Throwable Roads

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Abstract: In this article discussed the road surface elements and data analysis of environmental impact assessment. The main purpose of work is to give recommendations to improve the working conditions and given scientific conclusions which will be used in future road design and highway projecting.

Key words: safety, accident, method, traffic.

Today, as a result of the increase in the speed of traffic and the change in the structure of the international and national highways of the Republic, the number of road traffic accidents (TCAs) is increasing, especially the severity and severity of the incidents is observed. The analysis of available statistical data [2] shows that today the number of accidents per 1 km of highway is 0.28 accidents/km, and the number of people injured and killed in these accidents is 0.34 people/km. constitutes If these indicators are considered in the example of mountain roads, several times it will give large indicators. The increase in accidents will cause a huge amount of damage to the economy.

The number of public roads in our republic is 42,869 km, of which 3,240 km are mountain roads, and this is 7.5% of the total road network. Driving conditions on mountain roads are somewhat more complicated than other roads. It is important to ensure the comfort and safety of vehicles, especially on the mountain roads. In our republic, there are "Kamchik", "Oqrabot" and "Tahtaqoracha" passes of the A-373 and M-39 highways, which are of international importance. more than 120 mln. nearly 100,000 passengers are being transported. The year-by-year increase in the speed of traffic on these highways (Fig. 1) leads to a decrease in the comfort and safety of the traffic flow on the road. Ensuring the ease and safety of traffic flow on these roads is one of the most important tasks of the republic's road technical policy today.

Figure 1. A graph of the change in movement speed over the years.

It is known from the studies conducted on the laws of the speed of movement on the roads [1, 2, 3, 4] that every year the structures of cars are improving and their average speed on the roads is increasing. More than 60% of a vehicle type in a traffic flow indicates that the traffic flow is representative of that type of vehicle. Today, passenger cars make up 60-75% of the traffic flow on international roads and 75-90% of the traffic flow on state and local roads. .

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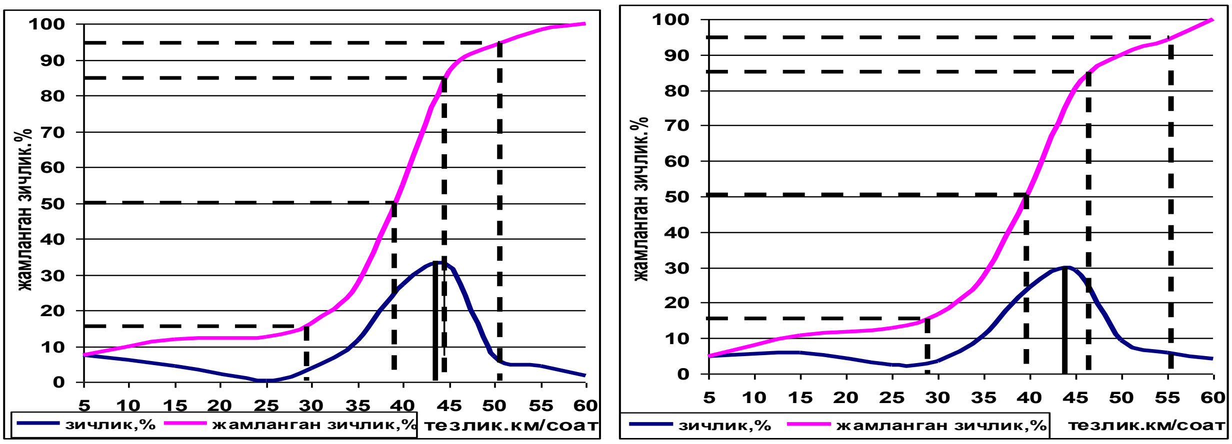
118, 119, 120, 122, 123, 124, 128, 132, 145, 152, 153, 154, 155, 157 of the 4-lane internationally important highway A-373 "Tashkent-Osh" , 165, 167, 168, 169, 170, 172, 173, 174, 175, 180, 185 km sections were studied. In the researches, the speed of movement of cars on the ascent and descent was determined in the dangerous parts of the Kamchik Pass (Fig. 2).



Descending Ascending

Figure 2. Curves of distribution and accumulation of speed of cars in the passage section of the road

This road section is 165 km 1 picket, the height above the sea level is 1184 m, the rise height is 14%, the road bite coefficient is 0.31, the width of the road base is 29.5 m, the width of the carriageway is 20.8 m, the dividing strip width-0.6 m, turning radius - 132/175 m, visibility distance 85 m.

In order to investigate the state of traffic flow, experimental studies were conducted on 4-lane (M-39, A-373) international and state highways. In the experimental studies, the movement of traffic flow was recorded by a digital video camera "VICTOR". The images were processed in BRAND Fujitsu Siemens Note book AMILO D8850 computer software. In the conducted experimental studies, the minimum number of measurements was determined as follows [3]:

$$n = \frac{t^2 \cdot \sigma^2}{\Delta^2}$$

In this $t-$ assumed reliable probability function, $\alpha = 95\%, t = 2{,}0$; $\sigma = \frac{R}{6}; \sigma -$ expected mean square deviation of speed, km/h; speedometer, km/h; $\Delta = 2$ км/ clock-measuring accuracy. $n = \frac{2^2 \cdot 12^2}{2^2} = 144$ та – clock-measuring accuracy. The maximum speed of the traffic flow on the pass sections of the highways is 30 km/h when going downhill, 35 km/h when going uphill, when the traffic composition is 70% passenger cars and the speed is 7000 hp/h, the mean square of the speed deviation 11.7 km/h, 80% passenger cars and 800 hp/h driving speed 55 km/h downhill, 50 km/h uphill, modal speed 63 km/h, mean square speed deviation 11, 9 km/h, traffic composition 90% and traffic speed 9000 rpm 67 km/h downhill, 63 km/h uphill 87 km/h, modal speed 70 km/h, root mean square deviation of speed 12.5 It was found to be km/h (Fig. 2) and the change in the speed of movement conformed to the normal distribution curve (polymodal).

According to the instructions of ShNQ 2.05.02-07 "Highways" for complex mountainous sections of highways, the estimated speed on this section of the road is set at 60 km/h [5].

Rated speed refers to the maximum possible speed of a single vehicle in the most unfavorable sections where the permissible limit values of the road elements correspond to the normal conditions of the weather and the contact of the tire with the surface of the road.

Standard contact condition of a car tire with the surface of the carriageway is the coefficient of longitudinal contact at a speed of 60 km/h for a dry or wet clean surface: 0.6 for the dry condition, at least 0.45 for the wet condition - in the summer season of the year with an air temperature of 200C, relative humidity of 50% , the meteorological visibility distance is more than 500 m, and the atmospheric pressure is equal to 760 mm Hg in windless conditions.

The complex parts of the low-elevation area include deep ravines and ravines with unstable slopes, a relief cut by frequent deep valleys and watersheds, with a difference of more than 50 m between elevation marks at a distance of not more than 0.5 m. Complex parts of mountainous terrain include ridges and mountain gorges with complex, curving or unstable slopes.

The indicator of the efficiency of the use of cars with carburetor engines is the relative performance of the car, the effective power of the car, the values of the change in fuel consumption for every thousand meters above sea level, that is, for every 1000 meters of the road's height above sea level, the speed decreases by 10-15%, and the fuel consumption by as much percent increase was found.

It was found that the performance indicators of the use of vehicles change with every thousand meters of elevation of the mountain highways (Figure 3).

Figure 3. Performance indicators of vehicles

A large number of and sudden changes in road conditions on mountain highways in a short distance lead to variability and complexity of traffic conditions. The levels of comfort, safety and economy of traffic conditions on mountain highways are up to 2.5 times lower than roads in other regions.

Here are the main causes (in percentages) of accidents that occurred in Kamchik Davan:

1. Collision – 10%.
2. Distance maintenance - 21%.
3. Throwing out of control - 20%.
4. Hitting an obstacle - 14%.
5. Overtaking collision – 10%.
6. Leaving the opposite road - 15%.
7. As a result of falling asleep - 2%.
8. Hitting a parked vehicle – 6%.
9. Due to technical failure – 2%.

From these figures, it can be seen that the main accidents are caused by failure to keep the distance, loss of control, crossing the opposite road and hitting the barrier.

In conclusion, it is necessary to develop methods of road safety assessment on mountain roads based on the urgency of ensuring traffic safety on mountainous parts of highways, improving road traffic-use quality indicators and ensuring traffic safety.

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